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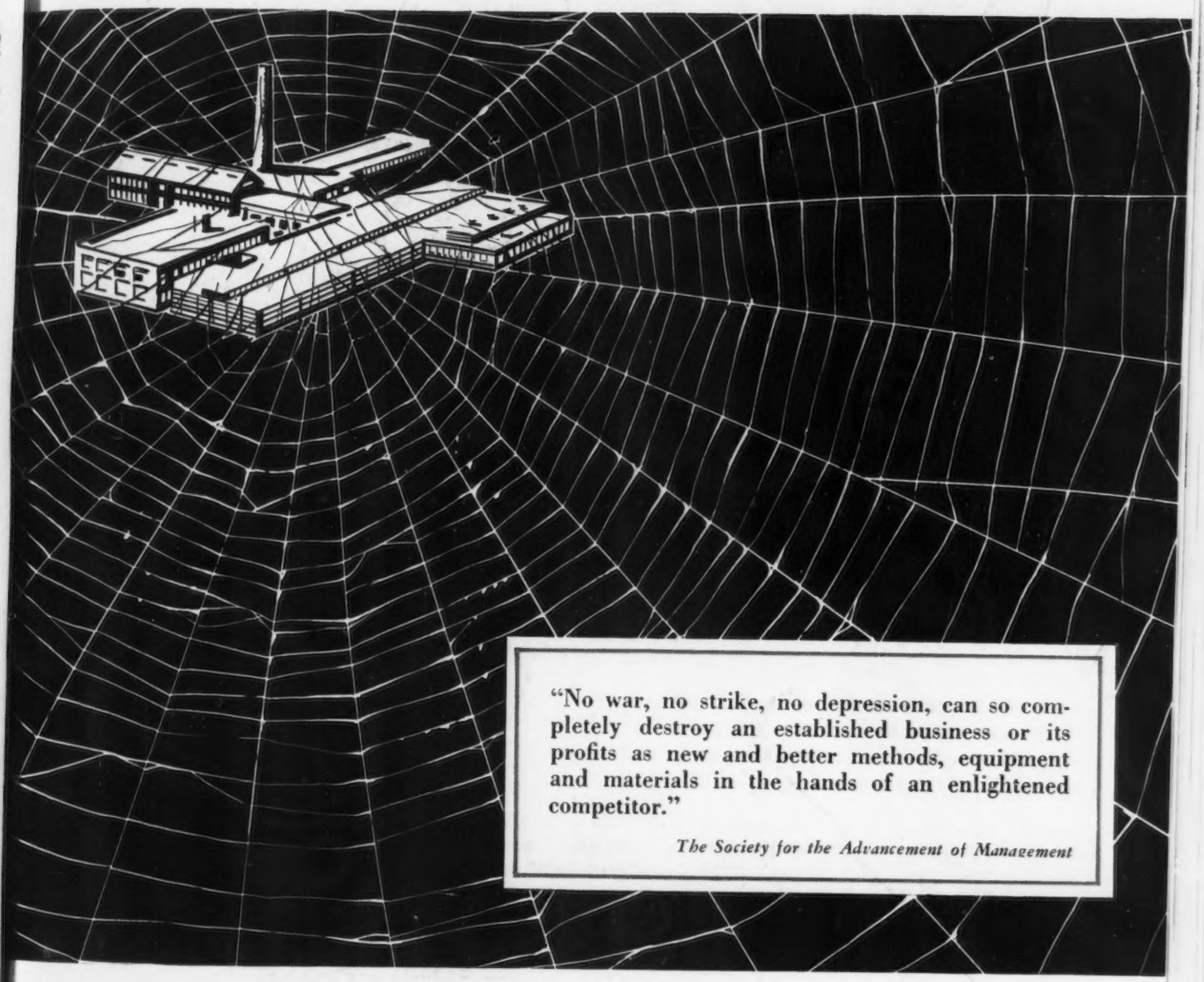
The IRON AGE

JULY 21, 1949



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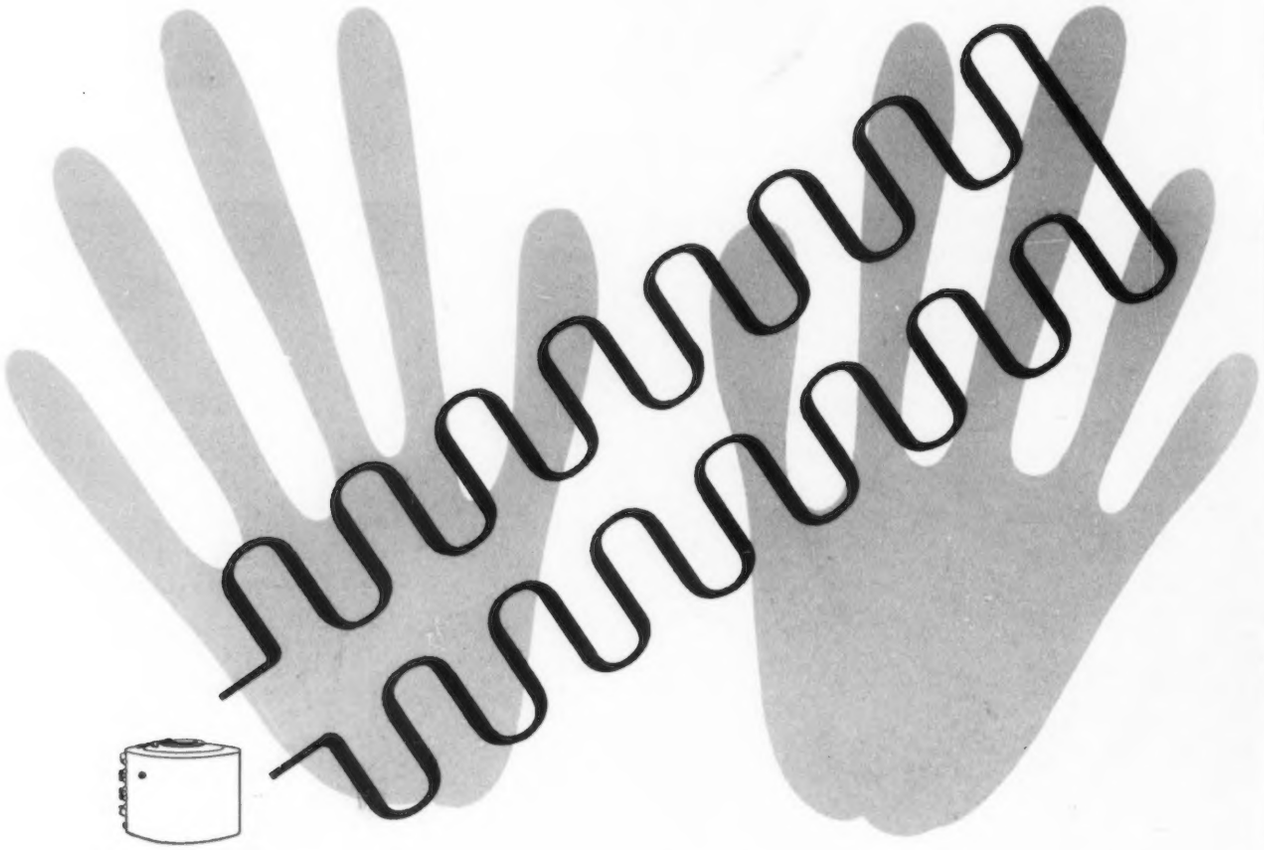

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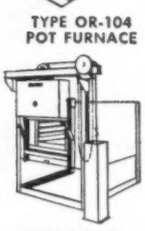

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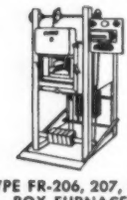

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The Steel Truce

PHILIP MURRAY has won the first skirmish in the steel wage controversy. But he had the help of his good friend Harry Truman. And Mr. Truman had the help of the office of President of the United States. Major steel firms at the last minute felt they had to bow to the President's proposal calling for a three-man board which will make recommendations on the wage stalemate. But they said they would not be bound by the board's recommendations.

The next 60 days, however, are only a truce. Federal interference prevented a steel strike, which the union otherwise might have lost. How the steel industry was maneuvered into the position it now is in is slightly ironical. It will still have to stand up and fight later if the board finds in favor of the union and against the steel firms.

To save face and to show his strength Philip Murray threatened to call a strike when his demands for a wage increase, liberal insurance program and pension negotiations were turned down. But he knew as well as anyone that this was no time to strike—and make it good.

Steel order backlogs were disappearing rapidly. New order volume for steel was off sharply. More ominous were signs that the industry was headed for a painful "corrective" period. For the first time in years the steel industry was top dog at the bargaining table. Now was the time to stop being expedient. If steel were ever to take a stand against continual wage increase and higher labor costs that time was now.

Mr. Murray moved quickly. With his support the President sidestepped the Taft-Hartley law. He suggested appointment of a three-man board which would hear both sides and make recommendations. This eliminated the use of the injunction and replaced a fact finding board with no power of recommendations with one which had.

Steel people were in a hot spot. Some went along with the President. Others balked. The strongest holdout was United States Steel Corp., which leads the fight against higher wage costs. Mr. Murray came to Mr. Truman's aid by threatening to strike all plants which did not agree to his proposal.

U. S. Steel, through B. F. Fairless, still refused to go along. He suggested the use of the Taft-Hartley procedure. At the last minute cracks appeared in the industry's united front. Companies went down like dominoes. U. S. Steel finally fell into line reluctantly.

The next showdown will not come until the board makes its recommendations. Any in favor of the union will be more than the steel companies had offered.

It may be that before the whole fracas is over Mr. Truman will yet have to use his powers under the Taft-Hartley law because there may still be a steel strike.

Tom C. Campbell

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METALLURGY SALES OPERATIONS

► Research production of a synthetic substitute for the palm oil now used in making tinplate is nearing completion. About 7500 tons of expensive palm oil is used annually in hot dip tinning. Mill tests on a wide scale will begin as soon as the research project is finished.

► General American Transportation Corp. has received from Solvay Process Co. an order for 100 aluminum tank cars, the largest order for this type car ever placed. They will be fabricated of heavy aluminum plate with stainless steel fittings. Aluminum was selected because it will resist the acid fertilizer to be carried and will cost less than all-stainless cars.

► Australia has recently received 10,000 tons of manganese ore from Russia. This supplements diminishing imports from India, which has been increasing its shipments to the U. S. Meanwhile, though Russian shipments to the U. S. were halted in April, some 20,000 tons of Russian ore reached the East Coast this month and at least 30,000 more tons are expected.

► Before the year's end there will be about 8000 business failures. This compares with 5252 last year and 3476 in 1947. Retailing led the list during the first quarter with 45.2 pct of the total. Mining and manufacturing were next with 24.5 pct.

► One indication of the growing tightness of the automobile market is the rise of credit buying. Latest figures show that total outstanding instalment credit was $2.3 billion on June 1, an increase of 36 pct over a year ago and a gain of 6 pct since May 1. It can also be interpreted as increasing public confidence in the future.

► An effective metal scraper can be made by brazing cemented carbide blanks to an old file. The improvised carbide scraper is said to last several times longer than equipment formerly used on both round and flat work. A 4° negative rake eliminates any tendency to jar or shatter.

► Fuel costs on a house heated by warm air may be reduced by as much as 10 to 20 pct by wrapping the heating ducts with aluminum foil. Ordinary household aluminum foil in 12-in. wide rolls is suitable. Material costs less than $10 and savings should approximate $20 a year in a small house.

► Washington sources report that USWA president Philip Murray personally saw President Truman just about 2 weeks before the latter advanced his plan for handling the steel strike threat.

► The manufacturer of a gadget that warns drivers when they get too close to the curb has switched from chrome plated music wire to stainless steel, reducing costs by more than half.

► A homogenized paint that need not be stirred is in the final stages of development. The homogenization process uses ultra high frequency sound to obtain the dispersion needed to preclude stirring. A 2000-w sound generator with a speed of 150,000 rpm is being used in current research. The machine develops 150,000 cycles per sec.

► One reason automobile manufacturers are optimistic about the future market for cars is low dealer stocks. Some 33 pct of the Chrysler dealers haven't a single car on hand—not even a demonstrator. Only 2 pct of this division's 3350 dealers have as many as 10 cars in stock. In the prewar era auto dealers might average 5 cars per dealer and 2 pct of the dealers might have 100 cars in stock.

► Aluminum alloys are now being used in aircraft applications where designers once thought only steel would do. The high temperatures generated in supersonic flight appear to be the only important threat to the constantly increasing use of aluminum alloys. In this field stainless and Inconel will probably rule until titanium advances far enough to threaten them.

► Inventory cutting by steel users is giving warehousemen a little more business than they might normally expect. Although this is a normal warehouse function the unbalance of consumer inventories is boosting the number of rush orders.

► Supervisors at the Westinghouse East Pittsburgh plant get the latest information on company policy, new orders, production, etc., by dialing a number on the interplant phone system. Recordings changed several times a week give a 3 to 5-min message to as many as 30 people at once.

HOT SPOT MACHINING

BY SAM TOUR
and
L. S. FLETCHER
Sam Tour & Co., Inc., New York

MOST power consumed in metal cutting is used in forcing the tool to shear the metal. The lower the shear strength of the metal, the less the power required to shear it. Another important consumer of power in metal cutting is in the plastic deformation of the chip being removed. The softer the metal, the less the power required to deform it. Since both shear strength and hardness decrease as metal temperature increases, it was postulated that an increase in temperature would reduce the amount of power required for machining.

Throughout the years coolants on the work and cutting tool have been used to aid machining To reverse this procedure and intentionally heat the work ahead of the tool departs radically from accepted practice.

Early in 1946, Sam Tour & Co., Inc., proposed to the U. S. Navy that Hot Spot Machining* might permit greatly increased production per machine per man hour in machining such items as ship shafting, gun forgings, shell forgings and other parts of heat treated plain carbon and low alloy steels, of parts made of high alloy steels such as stainless and heat resisting steels, and of such refractory alloys as the complex cobalt-chromium-molybdenum-tungsten alloys used for high temperature service in jet engine rotors and turbine blades. A Research and Development contract was entered into between Sam Tour & Co., Inc., and the Navy Dept., Bureau of Ships, to investigate the theory and to evaluate at least quantitatively some of the factors involved. The results proved the theory to be of merit.

The amount of metal removable per horsepower per minute can be increased by localized heating of the work ahead of the tool. For ordinary steel, heating to 1500°F increases the possible metal removal rate by 300 pct. For heat treated alloy steel of 120,000 psi tensile strength, the increase is of the order of 200 pct. For such refractory metals as the high temperature cobalt-chromium alloys used for jet turbines, which are almost unmachinable at room temperature, the increase in machinability by heating to 1500°F is of the order of 125 to 1.

The influence of temperature on the tensile strengths of various steels is shown in fig. 1, as reproduced from National Tube Co.'s Bulletin No. 26. Shear strengths decrease somewhat similarly to tensile strengths. Since an appreciable portion of the power required in machining is in shearing the work, it is evident that the load on the cutting tip of a tool should decrease as the metal temperature is raised.

One method of determining the soundness of the theory was to measure tool loads for different feeds, depths and speeds of cutting at room and at elevated temperatures. For this work a tool dynamometer was developed. The details of this development, applicable to many types of metal cutting, will be subsequently presented in a separate article. The relationships between tool loads and temperature of the metals being cut, however, are shown here for the various metals tested at the indicated temperatures.

A search of the patent and technical literature indicated that hot machining is not new. Of the work done, the most pertinent was by Krupp in Germany where steel had been machined while hot, using carbide cutting tools. The reference quoted is[1]: ". . . Experiments have been carried out in planing steel billets at 1000°C (1832°F) to take advantage of the softening effect of high temperature on the work. A special composition (for tungsten car-

** Trademark registration applied for by Induction Machining, Inc.*

At Work Temperatures of 500°, 1000° and 1500°F

Results of investigations of hot machining indicate that industry has available a technique of substantial significance for increasing metal removal rates. By localized heating of the workpiece just ahead of the point of machining, machinability of metals is radically increased, power consumption is reduced, tool life is improved, and part finish is excellent. Details of extensive studies in turning carbon and alloy steels and the high cobalt-high chromium refractory alloys are described in this article. Heating was both by induction and gas.

bide cutting tool tips) was used, containing 4 pct titanium carbide, 14 to 15 pct cobalt, and the balance tungsten carbide. An example was the planing of 100 ton molybdenum case hardening steel slab at a temperature of 800°C (1472°F) at a speed of 72 sfpm, depth of cut 0.32 to 0.39 in., and width of cut, 2.76 in. A chip from this test was about 5/16 in. thick and 2¾ in. wide. Krupp are building a special machine for hot planing, arranged so that the billet or plate can come straight from the furnace on to the machine."

The patent literature shows that attempts had been made to heat the steel ahead of the tool by direct resistance heating using the tool as one electrode and a contact on the work above or ahead of the tool as the other electrode. Apparently this procedure had never proved practical.

Concurrent with these investigations were the unrelated hot milling investigations by A. O. Schmidt, Kearney & Trecker Corp., Milwaukee.[2] Investigations at Sam Tour & Co., Inc., reported upon in the present article were based on lathe turning operations. Other investigations, in connection with drilling, milling and shaping of metals at elevated temperatures have been made, but are not included in this description.

After research and development work was started a patent covering the use of induction heating for the specific purpose of hot machining was found to have been issued in December, 1946. This patent was reissued in 1949, assigned to Induction Machining, Inc., Long Island City, N. Y. This company is the exclusive licensee under another patent soon to be issued in this field, and owns a number of patent applications now pending in the U. S. Patent Office.

The metals used for this work under the Navy contract were in the form of 3 in. diam bars, 24 in. long. Their compositions are shown in table I.

The S-816 alloy, 3 in. bar stock in 24 in. lengths, was solution treated at 2300°F for 3 hr, water quenched, aged at 1400°F for 16 hr, and then air cooled; and had a hardness of 286 Bhn.

The "V" grade nickel steel was heat treated in stock lengths before cutting to test lengths to insure uniformity of heat treatment and to avoid end effects. It was oil quenched and drawn back to 1050°F for 5 hr and air cooled, to get a material with a lower draw or tempering temperature than the hot turning temperatures. This permitted a study of the effects of hot cutting on heat treatment and hardness. The heat treating cycle was: Normalize at 1650°F for 3 hr and air cool; reheat and hold at 1475°F for 3 hr and oil quench; draw immediately at 1050°F for 5 hr, and air cool.

TABLE I

Analyses of Various Steels Used in Hot Spot Machinability Tests

	Low Carbon Steel	Medium "M" Carbon Steel	Grade "AN" Steel	Grade "V" Nickel Steel	S-816, High Temperature Alloy
Carbon	0.247	0.31	0.70	0.41	0.34
Manganese	0.49	0.75	0.43	0.81	1.44
Phosphorus	0.010	0.045	0.011	0.015	.....
Sulfur	0.025	0.055	0.01	0.028	.....
Silicon	0.090	0.25	0.20	0.25	0.23
Nickel	.....	0.25	1.64	3.39	19.74
Chromium	.....	.....	0.93	0.20	19.49
Tungsten	.....	.....	.....	.....	4.33
Molybdenum	.....	.....	1.64	0.06	4.17
Copper	.....	0.35	.....	.....	.....
Vanadium	.....	.....	0.02	.....	.....
Cobalt	.....	.....	.....	.....	42.15
Columbium	.....	.....	.....	.....	3.05
Iron	.....	.....	.....	.....	2.67

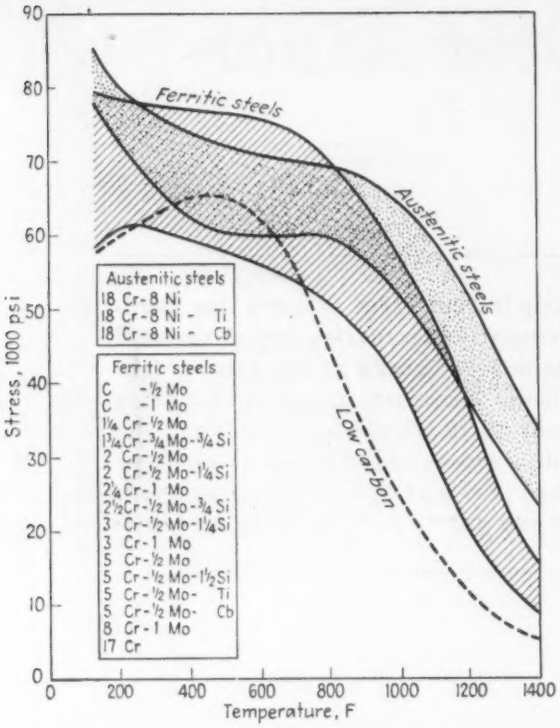

FIG. 1—The influence of temperature on the tensile strength of low carbon and ferritic and austenitic creep resistant steels is shown by these stress-temperature curves. The reduced tensile strength at high temperatures lead to the investigations of machinability at elevated temperatures.

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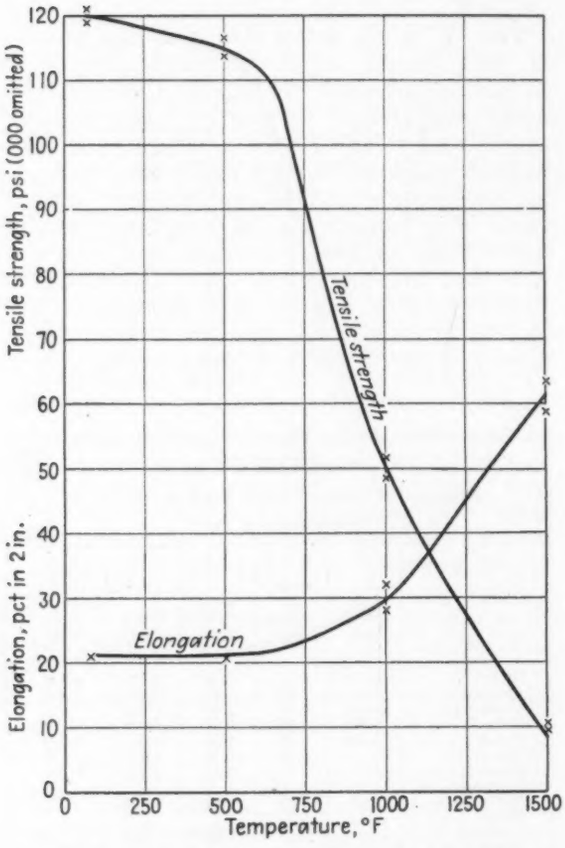

FIG. 2—Grade "AN," a heat treated nickel steel used in the machinability tests had these tensile properties at the various temperatures indicated.

To obtain basic data on the "V" steel before hot machining, elevated temperature tensile tests were made. Using standard 0.505 in. diam tensile specimens, two each were pulled at room temperature, 500°, 1000° and 1500°F to get the information included in table II. The hot specimens were heated in an electric furnace mounted on the tensile machine. After being soaked at the desired temperature for 20 min, the specimens were pulled in the furnace. Temperatures were measured by thermocouples. Pull speeds were ¼ ipm except the samples tested at room temperature. A 0.02 ipm cross-head speed was used on these to get yield strength data and the pull was then completed at ¼ ipm. The results given in table II are illustrated in fig. 2.

The machine used in the tests was a Reed-Prentice, 14 in. sliding gear-head lathe. To it were rigged necessary fixtures and mountings for both induction heating and gas heating equipment, tool and machine coolant lines, strain gages and indicators, and a watt-hour meter for power consumption measurement. In preliminary examinations, it was found that in heating the work in the lathe there was longitudinal expansion, and a spring loaded lathe tailstock was designed to take up the expansion.

Fig. 3 is a sketch of one of the fixtures used to mount induction heating coils powered from a 10 kva induction heater. The drawing shows a pancake type coil in the Transite housing designed to prevent arcing from the coil contacting the chip. The cutouts in the Transite sides of the housing, smaller in diameter than the ID of the coil, prevented shorting by coil to test bar contact. Asbestos spacers were placed between the Transite sides, and vibrations in the coil were minimized by the solid supporting fixture. This pancake type coil concentrated the magnetic field in the test piece in a narrow band directly under the coil.

The heating coil, mounted on the carriage independently of the cross slide, permitted the tool to be engaged without changing the clearance between the coil and the work. The coil was mounted at a 3° angle so that its plane was slightly off the perpendicular to the longitu-

TABLE II

Elevated Temperature Tensile Tests on Grade "V" Nickel Steel

Nominal Temperature Of Test, °F	Test Sample No.	Upper Thermocouple At Start of Test, °F	Center Thermocouple At Start of Test, °F	Tensile Strength, Psi	Elongation In 2 In., Pct	Reduction In Area, Pct	Yield Strength (0.2 Pct Offset), Psi
72	1	....	....	119,400	21	61.3	92,800
	2	....	....	121,000	21	61	93,800
500	1	....	520	117,000	21	51.8	.....
	2	500	515	114,000	21	55.2	.....
1000	1	995	1030	51,800	28	84.3	.....
	2	1000	1030	48,800	32	84.8	.....
1500	1	1470	1510	10,400	59	89.7	.....
	2	1500	1520	10,000	64	87.9	.....

dinal axis of the work. Near the cutting tool it was closer to the headstock. This had the effect of slightly widening the high heat zone under the coil and making it possible to bring the cutting edge of the tool closer to the high heat zone.

The high heat zone was about ¼ to ½ in. wide and was approximately constant while the coil traversed the work, moving with the work at about the same rate as the coil and the cutting tool. Another section of the total visible heat zone was in advance of the high heat zone and of a lower temperature. Depending upon the amount of power supplied by the induction heating coil, the depth of cut and the speed and feed of the work, the metal at the base of the cut may be barely at a visible heat, i.e. 1100°F, when the surface being machined is at about 1500°F.

For use with a 20 kva water cooled, gap-type Ecco induction heating unit, a different design of coil was required. A coil, 3¼ in. ID, made of eight turns of 3/16 in. flat copper tubing instead of four, was designed and mounted in a Transite guard. This coil was a double-pancake type instead of the single-pancake type described, and tests indicated that it would heat the surface of a 3 in. diam workpiece to over 1500° in less than 6 sec. The coil, when traversed at the 0.010 in. per revolution feed with a lathe speed of 73 rpm, was able to maintain a surface heat on the bar under the coil of over 1500° for a run of over 5 in., even though full power of the unit was not applied.

At the suggestion of the Navy, a new and improved heating coil for the induction heater was built. Called the *Flux Concentrator*, it consisted of a primary coil of 14 turns of 5/16 in. copper tubing. The turns were closely spaced, insulated with glass tape, and water cooled with water pressure 60 to 80 psi. While the coil shown in fig. 4 was not built exactly to the Navy specification, it shows in principle the flux concentrator idea. Within the primary coil is a single split turn secondary of copper. This secondary is connected to a single turn water cooled coil of smaller diameter. The gap between the copper

TABLE III

Results of Experimental Tests in Hot Machining Carbon Steel

Run No.	Temperature, °F		Tool Loading, Lb	
	Workpiece Surface	Chip	Tangential (Torque)	Longitudinal (Thrust)
6	75–125*	450**	385	230
4	75–125	450**	340	215
7	475	1100	285	205
7	600–700	1200	255	180
5	1000–1100	1200	195	150
5	1600	1750	130	135
8	75–125*	450**	290	170
11	75–125	450**	285	150
9	525	1100	200	130
9	600	1200	180	120
12	950	1200	155	100
12	1500	1550	125	80

* Estimated temperature of workpiece surface at end of cold cutting run.
** Not measured, but estimated from literature.

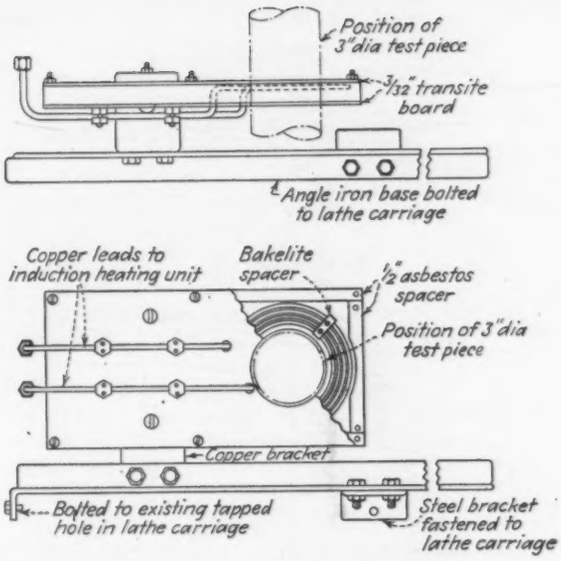
Position of 3"dia test piece
3/32" transite board
Angle iron base bolted to lathe carriage
Copper leads to induction heating unit
Bakelite spacer
½" asbestos spacer
Position of 3"dia test piece
Copper bracket
Bolted to existing tapped hole in lathe carriage
Steel bracket fastened to lathe carriage

FIG. 3—The induction coil used for heating test machining samples was mounted as shown. Transite boards held with brass screws and asbestos spacers formed the upper mounting for the coil, and the assembly was bolted to the lathe carriage.

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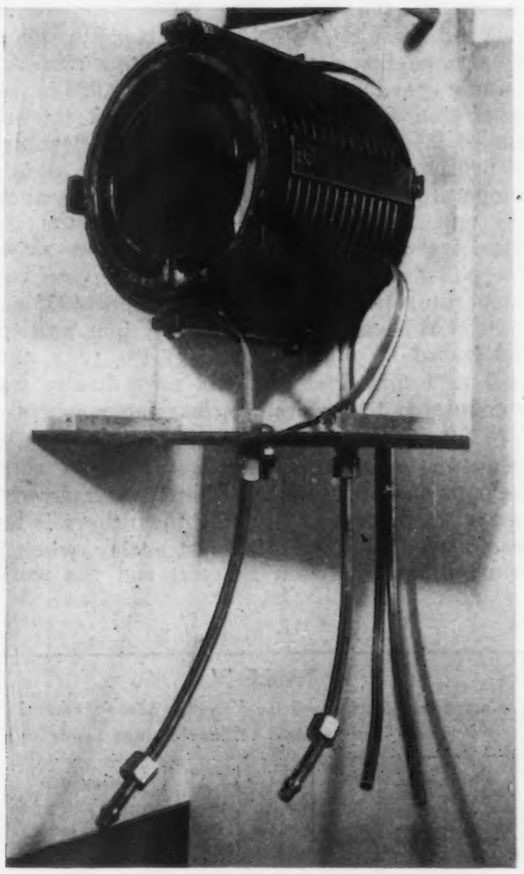
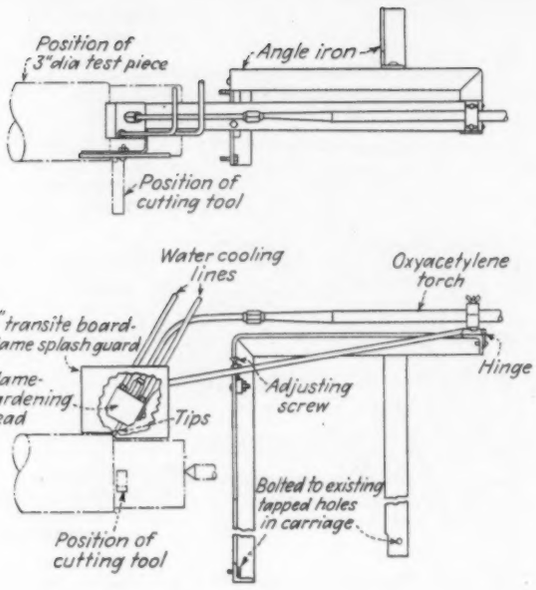
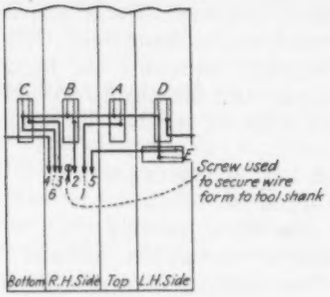


FIG. 4—The Navy designed flux concentrator type coil was the most successful heating coil for the higher alloyed metals. The coil illustrated shows the principle of the copper sheeting flux concentrator between the coils and the workpiece.





ABOVE

FIG. 6—Strain gages, mounted on the tool shank, measured tool loading. A, B, C, D and E are strain gages, E being a dummy gage for temperature compensation. Lead wires are numbered 1 through 6, the first five being active wires and the sixth the common lead wire.

LEFT

FIG. 5—The gas torch holding fixture arrangement as shown here was mounted similarly to the induction coil fixture so that the flame tips traveled with the cutting tool on the lathe..

secondary and the work was about 1 in., the gap between the single turn water cooled coil and the work was about ¼ in.

This coil heated a nickel steel, grade "V" in table I, to 1200°F in about 25 sec and after a short interval the temperature increased to 1500°F with the red zone traversing to the center of the 3 in. bar. The temperature dropped from 1500° to 1350°F after 6½ min at a carriage travel of 2.04 ipm. On a run at a spindle speed of 136 rpm, a feed of 0.023 in. per revolution, and a 0.25 in. depth of cut, the bottom of the cut was above red heat temperature. In heating S-816, the high temperature alloy, a temperature of 1500°F was reached in about 1½ min, and held for 6½ min with the carriage travel of ¾ ipm. Then the temperature dropped from 1500° to 1400°F. On one run, temperature was maintained between 1400° and 1500°F at a carriage travel of ¾ ipm, and the run lasted 10 min. The rest of the runs were held to 1 min duration, and no difficulty was encountered in maintaining bar temperature.

In all of the work using the gap-type high frequency generators with multiple turn coils, the coils operated at a considerable voltage with respect to the work. In using them there is the possibility of arcing. Heaviest arcing, when it occurred, was between the coil and the work. Arcing between the tool and the work was lighter, but some slight pitting of a carbide tool occurred. Arcing between chip and the lathe was usually light. Arcing was reduced further by use of a step-down transformer and a properly balanced circuit.

Using a 30 kva Tocco 9000-cycle motor generator set with a stepdown transformer and suitable condensers mounted on the rear of the lathe carriage, it was possible to use a single turn low voltage coil which gave no trouble with arcing.

In using gas and torches as a heat source, the torch hookup can be varied, both as to the gas used and the flame heads. A variety of flame heads were tried and several were found acceptable. The torch holding fixture is shown in fig. 5. The curved stem Linde Air Products Co. torch was connected to a seven tipped flame

TABLE IV

Comparison of Hot and Cold Cutting Metal Removal Rates on Carbon Steel at Equal Torque Loads

Work-piece	Cutting Temperature, °F	Spindle Speed, Rpm	Feed, In. per Revolution	Depth of Cut, In.	Tool Loads, Lb	
					Tangential (Torque)	Longitudinal (Thrust)
A	72	73	0.006	0.0625	140	80
	1550	73	0.015	0.0625	130	140
B	72	136	0.003	0.0625	120	80
	1450	136	0.003	0.165	110	90

TABLE V

Results in Hot Machining Low and Medium Carbon Steels

Run No.	Temperature, °F		Tool Loads, Lb	
	Workpiece Surface	Chip	Tangential (Torque)	Longitudinal (Thrust)
Low Carbon Steel (0.25 Pct):				
21	65–80	750–800*	285	150
22	1100	1300	155	110
24	1200	1250–1300	155	110
22	1500	1500	135	100
24	1650	1650	140	90
Medium Carbon Steel, Navy grade "M" (0.31 pct):				
13	75–100	400**	295	180
14	1150	1250	90	80
14	1275	.....	90	60
14	1650	1850	80	50

*—Tempilstick reading as chip passed over cutting edge of tool.
**—Estimated from color of chip when cooled.

head and an adaptor was made to connect this stem to a gas mixer. A shield to guard against flame splash in the direction of the tool was made of ¼ in. thick Transite, as shown. The mixer had a rated hourly capacity of 79 cu ft of acetylene and an equal quantity of oxygen. The flame head had a capacity of 90 cu ft per hr of acetylene plus an equal quantity of oxygen, with seven tips burning. The tips were arranged in two parallel rows of four and three tips, but since a narrow heating zone was found best, the three tip row was plugged off. The openings of the tips were No. 50 drill size, and a neutral flame was obtained by using acetylene pressure of 5 lb and oxygen pressure of 10 lb. Later it was found that a slightly oxidizing flame, with about 5 pct excess oxygen, gave less flame splash, a hotter flame, a shorter blue cone, and was more suitable for hot machining. The torch was mounted so the end of the flame was 3/16 in. from the surface and tilted so the flames are 10° to 15° out of perpendicular and directed in the direction of travel of the cutting tool. It was found later that better results could be obtained with the flames perpendicular to the work.

In temperature measurement, contact pyrometers, optical pyrometers, thermocouples and Tempilsticks were used. Power consumption during machining was measured by a watt-hour meter in the power line of the lathe, and watt meter readings were taken of the power consumption by the induction heating unit.

A stream of coolant directed at the work, an inch or two behind the cutting tool but on the hot machined surface, cut down the total heat in the finished work. Streams of coolant directed on the centers at each end of the workpiece maintained low temperatures at these points. A stream of coolant on the shank of the tool prevented overheating of the tool shank and tool post. A small piece of sheet metal fitted to the tool

TABLE VI

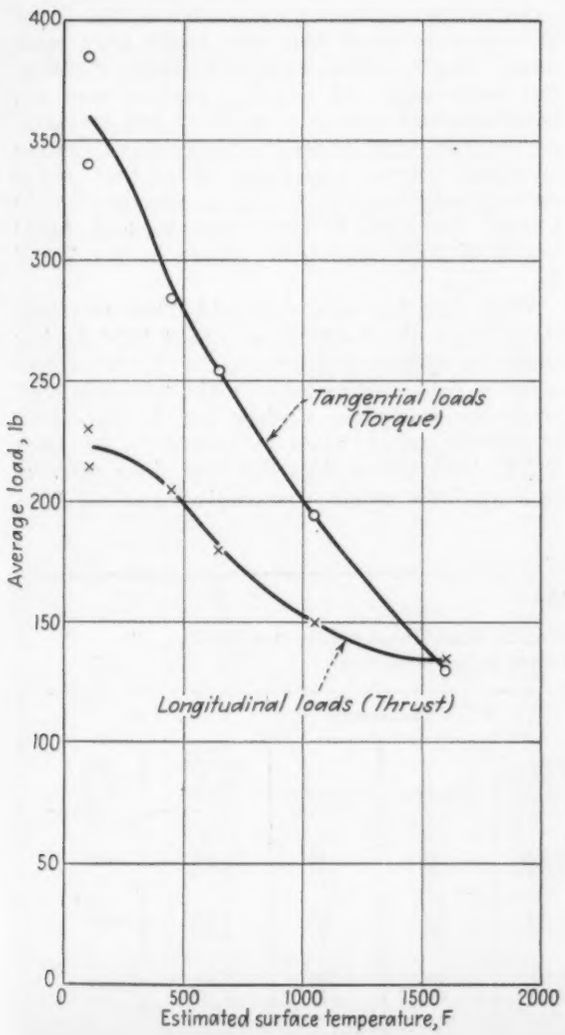
Results of Hot Machining Low Alloy Steel, Navy Grade "AN"

Run No.	Temperature, °F		Tool Loads, Lb	
	Workpiece Surface	Chip	Tangential (Torque)	Longitudinal (Thrust)
17	75–100	750–800*	345	235
18	1000	1250	195	155
18	1575	1650	130	120

*—Tempilstick reading as chipped passed over cutting edge of tool.

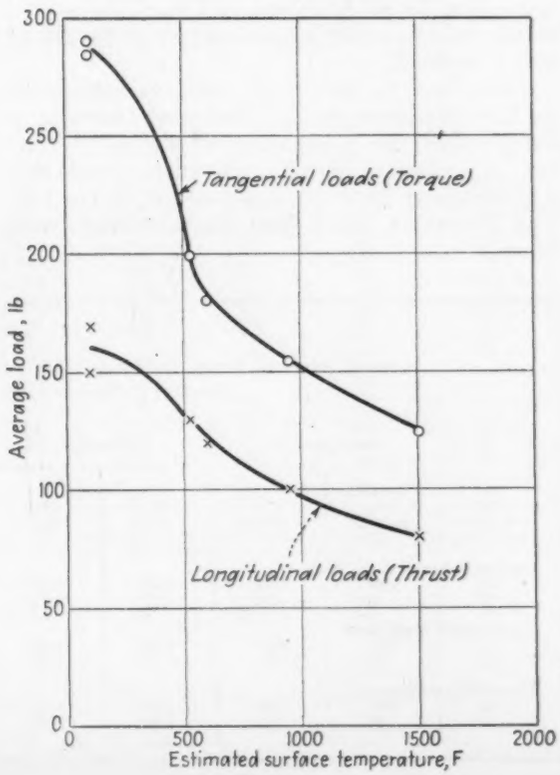
LEFT

FIG. 7—Tool loads v. work surface temperatures for grade "M" steel. These curves were based on test Nos. 4, 5, 6 and 7, all made on one test sample. Table III summarizes these runs.



BELOW

FIG. 8—Tool loads v. surface temperatures for grade "M" steel. These curves are based on tests Nos. 8, 9, 11 and 12, all made on a single test sample. Additional data on these runs are shown in table III.



shank just behind the cutting insert acted as a dam to prevent the coolant from reaching the chip or the tool tip.

In the measurement of tool loads, five SR4 strain gages were used, mounted on the tool shank with the tool post providing the equivalent of a support for a cantilever beam. Fig. 6 shows this arrangement, illustrating the relative positions of the gages as well as the wiring. Four gages were mounted on the four sides of the tool holder. The fifth was mounted on the left side, vertically to the shank, as a dummy gage to permit automatic temperature compensation.

The procedure in testing the machinability at various temperature levels was approximately the same for each of the five types of steel tested. A series of cold cutting runs was made at various spindle speed, tool feed and depth of cut combinations. The widely fluctuating loading of cold cutting, accentuated by the necessarily excessive overhang of the tool, made the results invalid when measured by the strain gage indicator alone. However, with an oscilloscope added to the load measuring equipment, a series of cold cutting runs demonstrated that consistent load readings could be obtained.

In hot cutting, the procedure was to heat the work to three levels of temperature, approximately 500°, 1000° and 1500°F, and compare the tangential and longitudinal tool loads obtained at those temperatures with loads obtained at the same speed, feed and depth of cut in cutting a cold workpiece. Work surface temperatures were taken by means of Tempilsticks, and, in the course of several runs and as the desired temperatures were reached, load readings were taken. In this way load readings were recorded for several temperature levels during the course of several runs on the same test piece. In all cases the tool loads decreased rapidly as the surface temperature of the metal was increased.

Variations in tool loads with variations in surface temperatures of the work provide a ready means for application of automatic control of heat input ahead of the cutting tool. For a given speed, feed and depth of cut, if the tool load increases, more heat input is required; whereas if the tool load decreases, less heat input is required. Variations in tool loads or tool post stresses as picked up by a tool dynamometer can be used with an automatic controller to vary the power input from the high frequency source and maintain a constant temperature of the work ahead of the tool.

Figs. 7 and 8 are curves derived from hot machining tests on a medium carbon steel (Navy grade "M" in table I), showing the relationship between surface temperatures of the work and tangential and longitudinal loads. Heating was with oxyacetylene. Complete data on these tests are given in table III. Fig. 7 was based on one series of runs—Nos. 4, 5, 6 and 7—while fig. 8 was based upon another series of runs, Nos. 8, 9, 11 and 12. Factors common to the individual runs in fig. 6 included spindle speed of 73 rpm, 0.015 in. per revolution feed, 0.0625 in. depth of cut, 2.906 in. diam bar, and a cutting speed of 55.5 sfpm. Factors common to runs shown in fig. 8 included spindle speed of 73 rpm, 0.010 in. per revolution feed, and 0.0625 in. depth of cut. Bars used in runs 8 and 9 were 2.836 in. diam and were cut at a speed of 54.2 sfpm. Bars used in runs 11 and 12 were 2.822 in. diam, and were cut at a speed of 53.9 sfpm. Tool loads appear to drop off most rapidly in the work surface temperature range of 400° to 1600°F.

The shapes of the curves shown in figs. 7 and 8 were considered tentative since they were based upon a limited number of runs. Further, the temperature of the bar surface was not considered an adequate index of the temperature at the point where the chip parts from the work and where a major part of the tool load is determined. The qualification also applies to curves for chip temperatures v. tool loads based on these same tests, shown in figs. 9 and 10.

When the bar was cut cold, chip temperatures were about 450°F, or about 325° higher than the surface temperature of the workpiece after a cold cutting run. Chip temperatures, when the workpiece surface was in the 1500° to 1600°F range, were estimated to be from 50° to 150° hotter than the workpiece surface. In the middle range of workpiece surface tem-

TABLE VII

Metal Removed Versus Estimated Work Temperatures at Equal Torque Loads, at a Spindle Speed of 73 Rpm and a Feed of 0.010 In. per Revolution

Run Number	Temperature, °F		Bar Diam., In.		Depth of Cut, In.	Tool Loads, Lb		Metal Removed, Cu In. per Min	Ratio, Hot to Cold
	Work-piece Surface	Chip	Before Cut	After Cut		Tangential	Longitudinal		
Medium Carbon (0.31 pct) Steel:									
14	1650	1850	2.870	2.741	0.0645	80	50	0.415	3.96:1
15	75	425	2.870	2.838	0.016	80	50	0.105	
Low Carbon (0.25 pct) Steel:									
22	1500	1600	2.948	2.820	0.064	135	100	0.423	3.32:1
23	75	475	2.945	2.907	0.019	130	60	0.128	
Low Alloy "AN" Steel:									
18	1575	1650	2.975	2.841	0.067	130	120	0.447	2.65:1
19	75	775	2.968	2.918	0.025	140	75	0.169	

peratures, the chip temperatured differentials were considerably higher, showing a red chip when the bar surface was in the black heat range. Table IV gives a comparison of the amounts of metal removed by hot and cold cutting when the tangential loads were about equal. These data would appear to indicate that, for a given torque load, about 2½ times as much metal may be removed in hot cutting as compared with the metal removed in cold cutting for this medium carbon steel. These load readings, however, were taken from various workpieces that were not analyzed and were obtained by several methods while trying out various load measuring techniques. More reliable data were obtained from later tests.

On another test, the two carbon steel test pieces were a low carbon and a medium carbon (Navy grade "M") steel of different microstructures, and their analyses are shown in table I. The medium carbon bar was 2.870 in. diam, had a Bhn of 192, and was turned at 54.7 sfpm. The low carbon steel workpiece was 2.948 in. diam, was turned at 56.3 sfpm, and had a Bhn of 116. Table V shows the results of these turning tests at the various recorded temperatures. The tests on the medium carbon steel include runs 13 and 14, while those on the low carbon steel include runs 21, 22 and 24.

Grade "AN," a nickel-chromium-molybdenum steel, of 0.70 pct carbon content of a general analysis as shown in table I, is recognized as one steel difficult to machine. Table VI shows the data for hot turning this steel. Hardness of the bar was 192 Bhn, it was 2.975 in. diam, and was turned at a speed of 56.9 sfpm. Table VII shows metal removal to work temperature ratios for approximately equal torque loads for the three steels.

Hardness reading was taken just below the surface of the "AN" alloy test pieces after hot and cold turning runs. After a surface cut at 1600°, hardness was about 94 RB; after a surface cut at 1000°F hardness was about 89 RB; and after a surface cut at room temperature hardness was about 85 RB. These readings were taken on a flat surface ground on the bar 0.004 to 0.006 in. below the surface. These hardnesses compare favorably to the original bar hardness of 192 Bhn, or 92 RB.

Test pieces were turned at room and elevated temperatures with the surfaces heated by a 20 kva high frequency induction converter. Lathe spindle speeds were increased progressively from 73 rpm to 91 rpm. Feeds and depths of cut were increased likewise from 0.010 to 0.020 in. per revolution and from 0.0625 to 0.1875 in., respectively. These increases were possible because the 20 kva induction unit had greater capacity to heat the 3 in. diam bars than did the oxy-acetylene torch equipment. The results of these tests are shown in table VIII. The effects on tool loads at elevated machining temperatures of an increase in spindle speed from 73 rpm to 91 rpm, an increase in feed from 0.010 to 0.015 in. per revolution, and an increase in the depth of cut from 0.0625 to 0.1875 in. are shown.

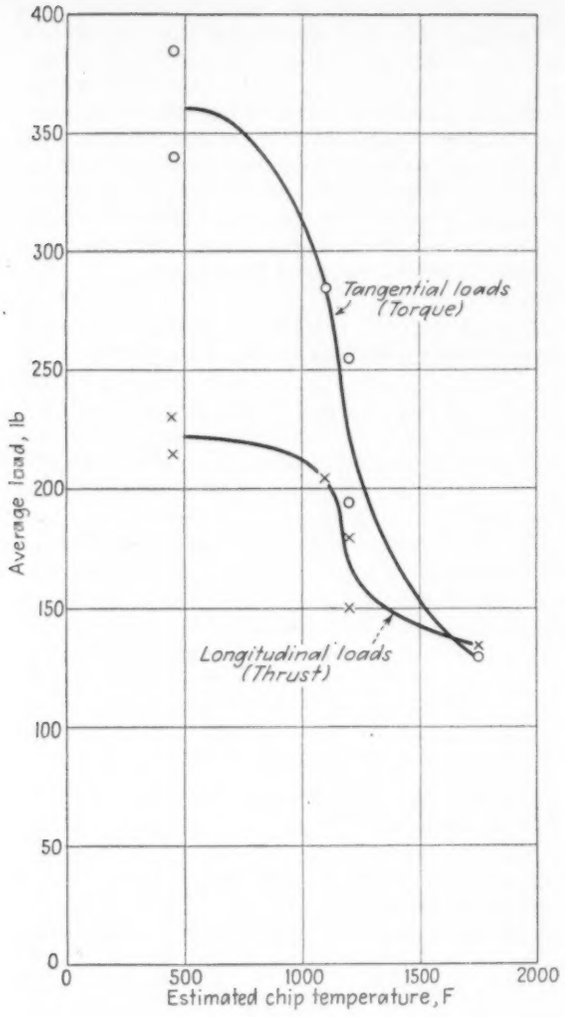
For the "AN" alloy steel samples, with the spindle speed of 91 rpm, feed of 0.020 in. per revolution, and depth of cut of 0.1875 in., torque loads on the tool while cutting at work surface temperatures of over 1500°F were between 770 and 845 lb. When an attempt was made to reach the same range of tool loads while cutting cold, at the same lathe speed and feed but at a lesser depth of cut, the tool failed. The carbide broke apparently because of the

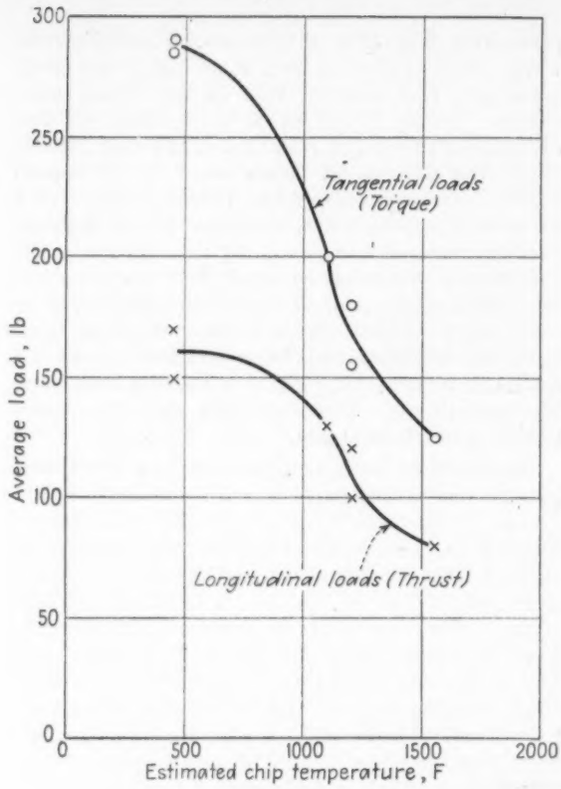
TABLE VIII

Results of Hot Machining Using Induction Heat

Workpiece Number	Run Number	Power Tap Setting	Spindle Speed, Rpm	Feed, In. per Revolution	Depth of Cut, In.	Temperature, °F		Tool Loads, Lb	
						Work-piece	Chip	Tangential (Torque)	Longitudinal (Thrust)
8	25	....	73	0.010	0.0625	80	775	285	170
(Low Carbon	26[1]	5	73	0.010	0.0625	1550	1700	140	85
Steel)	26[1]	5	73	0.010	0.0625	1425	1550	150	100
Bhn 121	26[1]	5	73	0.010	0.0625	1325	1450	150	110
	27	6	73	0.010	0.183	1500	1650	305	250
	28	6	73	0.010	0.183	1200	1350	375	280
	29	....	73	0.010	0.183	80	775	640	390
	30	....	73	0.010	0.0600	80	775	305	180
9	32	....	91	0.015	0.0625	....	....	320	205
(Low Carbon	33	6	91	0.010	0.1875	1500	1650	370	275
Steel)	33	6	91	0.010	0.1875	1400	1550	385	300
Bhn 124	34	6	91	0.015	0.1875	1500	1650	585	350
	34	6	91	0.015	0.1875	1100	1350	665	510
	35	7	91	0.015	0.1875	1500	1650	560	380
10	36	7	91	0.020	0.1875	1500	1700	845	710
("AN" Alloy	37[2]	8	91	0.020	0.1875	1500	1700	....	570
Steel)	38[2]	9	91	0.020	0.1875	1500	1600	820	....
Bhn 192	39	....	91	0.020	0.065	cold	....	470	340
	40[3]	....	91	0.020	0.120	cold	....	....	....
13	43	9	91	0.020	0.1875	1600	1750	770	650
("AN" Alloy	43	9	91	0.020	0.1875	1250	1500	830	700
Steel)	43	9	91	0.020	0.1875	1150	1300	875	735
Bhn 192									

1—Insufficient power input to maintain work temperature in 11-in. run at no. 5 tap. Additional tool loads as shown were taken as work and chip temperature fell.
2—Greater depth of penetration of heat shows decrease in tool loads.
3—Carbide insert tool broke, lathe stalled, and dog disengaged from faceplate. No load readings taken.





ABOVE

FIG. 10—Tool loads v. chip temperatures for the same runs indicated in fig. 8 show that tool loads decline as chip temperatures are raised.

LEFT

FIG. 9—Tool loads v. chip temperatures for the same runs indicated in fig. 7 show the effects of heat, either natural or applied, on the ability of a tool to part the work.

impact of dynamic loading (chatter) when cutting cold. Hot cutting had been accomplished without difficulty. It seems evident that the cold cutting torque load under these conditions was considerably greater than 2000 lb. When cutting hot, tool loads were steady, even when heavy cuts of 3/16 in. depth were taken.

For work such as shown in table VIII, the 20 kva converter and coil as hooked up were unable to maintain a 1500°F temperature at the surface of the work for any extended time when the spindle speed was 91 rpm and the feed was set at 0.020 in. per revolution to give a tool and coil traverse of 1.82 ipm.

In run 36, the coil to work gap was slightly more than ⅛ in. After a cut 3/16 in. deep on run 36, another hot run, no. 37, was made over the previously cut surface, making the gap slightly over 5/16 in. Run 38 was made later over run 37, with the gap over ½ in. These runs indicated that an optimum distance from coil to work, although desirable from the point of view of maximum efficiency of induction heating, was not as critical as expected from a

TABLE IX

Cold Cutting Test Runs on Grade "V" Nickel Steel

Run No.	Spindle Speed, Rpm	Feed, In. per Revolution	Depth of Cut In.	Tool Loads, Lb	
				Tangential (Torque)	Longitudinal (Thrust)
46	73	0.010	0.0625	420	200
47	73	0.010	0.125	610-680	390-420
48	73	0.005	0.0625	230	130
49	73	0.005	0.125	375	290
50	136	0.010	0.0625	400	195
51	136	0.005	0.0625	235	125
52	136	0.005	0.125	360	270
53	136	0.0025	0.0625	100	140

TABLE X

Hot Cutting Test Runs on Grade "V" Nickel Steel at Temperatures from 1000° to 1200°F

Run No.	Spindle Speed, Rpm	Feed In. per Revolution	Depth of Cut, In.	Work Surface Temperature, °F	Tool Loads, Lb	
					Tangential	Longitudinal
54	136	0.010	0.125	1100	320	240
61	136	0.015	0.125	1025	440	295
62	136	0.020	0.125	1000	565	330
63	136	0.010	0.156	1150	400	280
64	136	0.010	0.188	1125	480	315

total heat input standpoint. On the basis of this information, an induction heating coil of a fixed diameter can be used for a wider range of bar diameters than had been thought possible.

For the cold cutting test runs on grade "V" nickel steel, data are shown in table IX. These data indicate, as anticipated, that torque loads apparently change very little when lathe speed is increased from 73 to 136 rpm. If there would be any change, it would appear that torque loads may decrease under certain conditions with increased spindle speeds.

With bars heated by the double-pancake induction coil to temperatures ranging from 1000° to 1200°F, tests were run and the results are shown in table X. The relationship between torque and thrust loads on the tool, and estimated chip temperatures when cutting grade "V" steel at bar surface temperatures up to 1100°F are shown in the curves in fig. 11. These curves confirm the results of tests previously reported on low carbon, medium carbon and other alloy steels. With other conditions constant, tool loads fall off as the work surface and chip temperatures are raised. Both torque and thrust loads at chip temperature of 1500°F were about 50 pct of the loads recorded when cutting at room temperature. It will also be noted in fig. 11 that the temperature of the chip during cold cutting at the indicated lathe settings was about 1000°F. This is 200° to 300°F higher than chip temperatures recorded for previously reported cold cutting runs.

Using the flux concentrator induction coil, further tests were made on the grade "V" steels. By heating with this coil, it was possible to cut to a depth of ¼ in. with the base of the cut in the red heat zone. Table XI compares the theoretical volume of metal removal at the 5 hp rated capacity of the lathe. From these data, the ratio of metal removed, maximum hot to maximum cold, at 5 hp, is slightly less than 2:1.

Outstanding in results were the machining rates established for alloy S-816, Allegheny-Ludlum Steel Corp.'s high cobalt-low iron, high temperature alloy. Recommendations as to machining, developed by the National Advisory Committee for Aeronautics, were that the optimum metal removal rate, considering part finish, tool life, and other commonly associated factors, should be in the neighborhood of 2.1 cu in. per hr. At 1500°F, the volume of metal turned on a 5 hp lathe was 4.5 cu in. per min, with no noticeable tool wear during the tests, excellent finish, reduced power requirements, and lower tool loadings. In other words, instead of a metal removal rate of 2.1 cu in. per hr, heating to 1500°F permitted a metal removal rate of 270 cu in. per hr, an increase large enough to encourage the investment in required apparatus for heating the metal during machining.

The S-816 test pieces were heated both by oxyacetylene flame and the flux concentrator coil. To heat the S-816 alloy by a gas flame, two torch heads were set up in parallel, making eight tips available for the heating in one

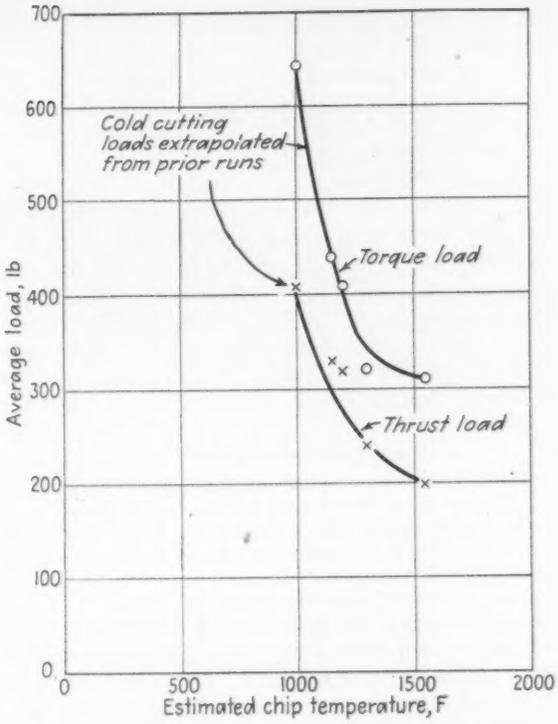


FIG. 11—Tool loads v. chip temperatures for tests Nos. 54, 55 and 56 on grade "V" steel (See table I for composition). Spindle speed was 136 rpm; feed, 0.010 in. per revolution; depth of cut, 0.125 in.; and cutting speed, 106.8 sfpm. Hardness of the test piece was 255 to 262 Bhn.

plane. One tip was closed off because it interfered with another, making seven tips operating. When cutting at a carriage travel of 1.1 ipm with a depth of cut of 0.140 in., the bar temperature dropped from 1500°F to 1200°F after about 2½ min of cutting. By reducing the carriage travel to about ¾ ipm, it was possible to cut for 10 min before the surface temperature dropped from 1500° to 1200°F.

With the flux concentrator it was possible to maintain a surface temperature of 1500° to 1600°F at a carriage travel of ¾ ipm for a total of 10 min.

Table XII compares the hot and cold machin-

TABLE XI

Metal Removal Rates for Grade "V" Nickel Steel at 5 Hp Lathe Capacity

Type of Cut	Spindles Speed, Rpm	Feed, In. per Revolution	Depth of Cut, In.	Temperature, °F Workpiece Surface	Metal Removed, Cu In. per Min.
Cold	136	0.0240	0.125	....	3.85
Cold	171	0.0168	0.125	....	3.38
Cold	212	0.0131	0.125	....	3.27
Cold	276	0.0079	0.125	....	2.56
Cold	136	0.0180	0.156	....	3.59
Cold	171	0.129	0.156	....	3.24
Cold	212	0.0084	0.156	....	2.62
Hot*	171	0.0191	0.156	1000	4.79
Hot*	212	0.0162	0.156	1300	5.04
Hot**	136	0.0230	0.250	1500	7.36

*—Heated with Double Pancake type coil.
**—Heated with Flux Concentrator type coil.

ing examinations conducted on S-816. Hot runs nos. 99a, 99b and 99c were made to find the effect of temperature upon tool load and power requirements, and not to compare the metal removal ratios of hot and cold cutting. While no direct comparison of loads between hot and cold machining can be obtained from table XII, it is obvious that the tool loads materially decreased when machining a heated workpiece.

In cold machining at 136 rpm, the cutting edge of the tool insert was worn in less than 1 min of cutting. For hot cutting tests, another grade carbide was used and visual examination indicated that tool wear was negligible after 9½ min of hot cutting. The National Advisory Committee for Aeronautics, in January, 1946, ran some shaping and milling tests of S-816 with high speed steel tools, removing between 0.45 and 3.06 cu in. of metal before the tool failed. In one turning test in the range of 1500°F bar temperature, about 13 cu in. were removed without evidence of tool failure. The NACA recommended metal removal rate of 2.1 cu in. per hr with high speed steel tools was easily surpassed by hot turning as shown in table XII.

Acknowledgments

Throughout this work the helpful suggestions of Com. R. H. Lambert of the Bureau of Ships, U. S. Navy, have been of inestimable value. Permission of the Bureau of Ships to publish the results of the work done under its sponsorship is acknowledged.

Fig. 12 shows the depth of cut and chips resulting from hot machining of S-816 with the flux concentrator as the heat source. Tool condition was good after hot cutting more than 13 cu in. of S-816.

In hot machining the grade "V" nickel steel, the chip was taken off as a continuous ribbon. The problem in hot machining S-816 was that chips broke into short curls in lengths varying from ½ to 2 in., as shown in fig. 12. The majority of the chips accumulated beneath the cutting tool. They stayed at red heat for a considerable length of time.

In substantially all of the lathe work to date a carbide insert type of tool holder has been used. As a typical example, for the S-816 alloy, a Super Tool Co., square, insert-type, right hand turning tool was used, set at the following angles: Back rake, –9°; side rake, –9°; end relief, 9°; side relief, 9°; end cutting edge, 5°; side cutting edge, 5°; and nose radius 1/16 in.

Throughout the work there was no difficulty caused by tool wear or breakage of the carbide inserts during hot cutting, and chatter was absent.

Nothing has been done in an investigative way regarding tool design or tool angles. There is no assurance that the tool design or angles used are the best for the purpose. Work along this line is in progress.

The hot turned surfaces of all the test pieces had finishes noticeably superior to surfaces cold turned under the same cutting conditions. Small transverse tears in the surface of steel as cold cut are entirely absent in surfaces as cut hot. Faxfilm and Brush Surface Analizer explorations show the great improvement in surface finish obtainable by Hot Spot Machining. More work along this line is in progress.

The chip resulting from hot cutting of steel is a continuous strip, except in the case of the S-816 high temperature alloy, where the chips were relatively short. A comparison of the chips resulting from cold and hot cutting is shown in fig. 13. The upper curled and ragged chips are those from cold cutting. The lower continuous band is from hot cutting.

During the development work it was the practice for an assistant to the lathe operator to catch the chip with a hooked tool or a pair of tongs and pull it out of the way by drawing it past the tailstock end of the lathe. The chip is in fact a red hot plastic continuous ribbon. For production work, two fairly simple mechanical methods are proposed for handling this chip.

One method involves the use of a friction driven reel to wind the chip continuously. The other method involves the use of a hinged split tube lying horizontally above the tool shank and extending to a small chip chopper to be fastened on the tool carriage on the tailstock end. From the chip chopper, the short sections would be allowed to drop clear of the lathe pan or basin.

A few microhardness surveys and metallographic examinations of cross sections taken from test bars that have been Hot Spot Machined with surface temperatures of 1500°F show no appreciable effect on the steel remaining below the cut. This is particularly true of

TABLE XII

Metal Removal Rates for S-816 Alloy at Various Machining Temperatures

Run No.	Heat Source	Spindle Speed Rpm	Feed, In. per Revolution	Depth of Cut, In.	Temperature, °F		Tool Loads, Lb		Power Consumption, Hp	Metal Removed Cu In. per Min
					Work	Chip	Torque	Thrust		
97	Cold	91	0.015	0.0625	....	....	....	....	2.84	0.80
59	Cold	136	0.010	0.0625	....	....	410	320	....	0.80
99a	Gas	73	0.010	0.110	1200	....	350	250	....	0.76
99b	Gas	73	0.010	0.110	1300	....	230	230	2.01	0.76
99c	Gas	73	0.010	0.110	1500	1800	110	190	1.93	0.76
98	Gas	73	0.015	0.140	1500	1800	....	....	....	1.44
109	Flux	171	0.010	0.187	1500	....	....	....	4.08	3.01
110	Flux	171	0.015	0.187	1500	....	....	....	5.23	4.52

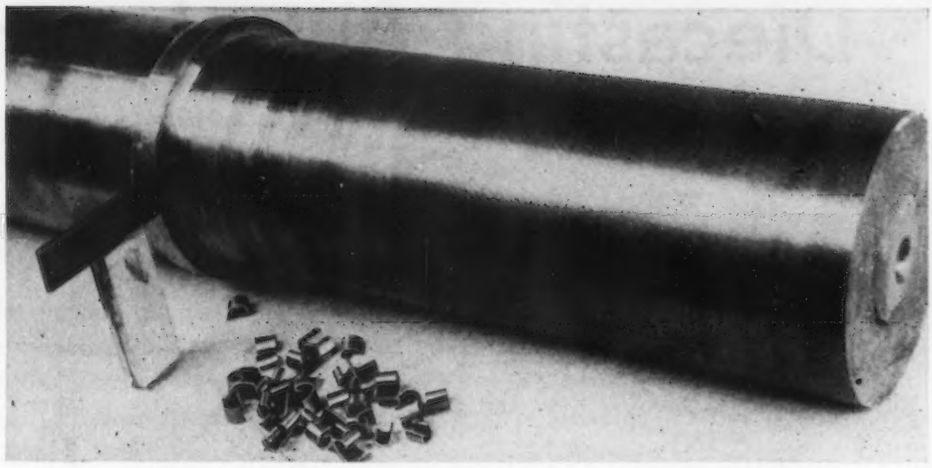


FIG. 12—In hot turning S-816 alloy, finish was good as shown here, and chips broke into ½ to 2½ in. curls. Metal removal rates were about 270 cu in. per hr, as against 2.1 cu in. per hr recommended for cold turning with high speed steel tools. Carbide tools were used in the tests and tool condition after hot machining runs was good.

the heat treated grade "V" nickel steel and of the S-816 alloy. More work of this nature is in progress. It is also planned to investigate and evaluate any residual stresses that may exist in the hot cut surfaces of these heat treated materials.

While the investigative work brought to light problems that have not yet been thoroughly solved, the program conclusively substantiated the belief that metals will machine more easily at high temperatures.

The amount of metal removed when cutting hot, compared with the amount removed while cutting cold, with torque load and all cutting conditions except thrust load and depth of cut held constant, for convenience, has been termed the metal removal ratio. These ratios hot to cold for this series of tests were: Medium carbon steel, 3.9:1; low carbon steel, 3.3:1; and "AN" grade low alloy steel not heat treated, 2.6:1.

Work has been concentrated on proving the feasibility of hot machining rather than in developing techniques or applications. Nothing has been done in an investigative way about tool design. Much of the machining was done with the square insert type tool, but there is no assurance that this is the best design. There are also the various other types of machine tools on which hot machining can be performed, but about which little or nothing has been done. Another phase is the application of a heat treating operation by using the coil for reheating, after cutting, and then quenching. These and many more facets of this new machining technique have to be investigated. The results to date indicate that hot machining will be a vital contribution to machining methods and knowledge.

References

(1) "The German Hard Metal Industry," by G. J. Trapp and others. British Intelligence Objective Sub-Committee, final report 1385, item 21, p. 55.

(2) "Hot Milling—Milling High Strength Alloys at Elevated Temperatures," by A. O. Schmidt, THE IRON AGE, Apr. 28, 1949, Vol. 163, No. 17, p. 66.

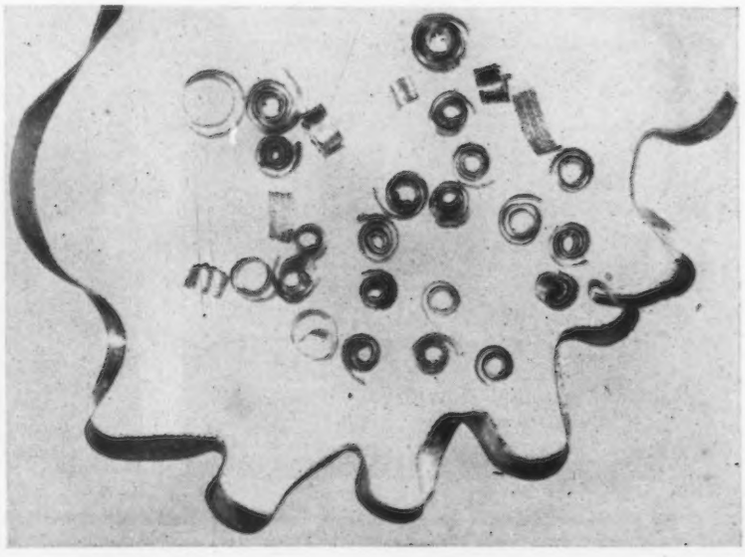
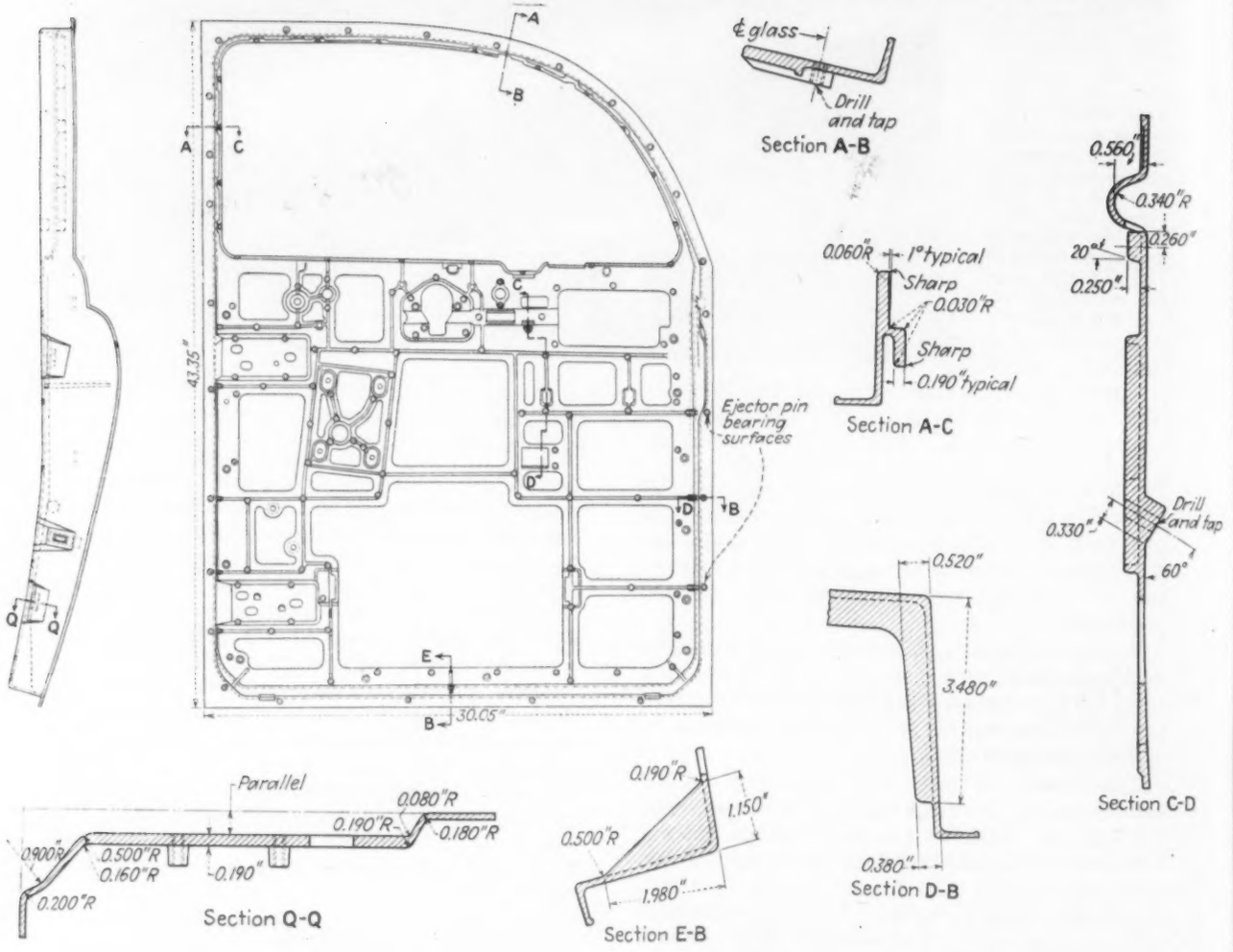
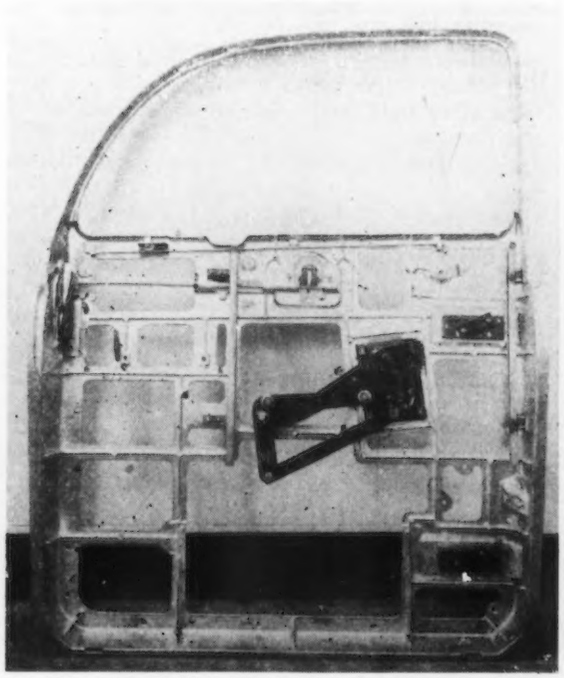


FIG. 13—Cold and hot turned chips from the same bar show the difference in chip formation. The hot turned chip, a long ribbon, made disposal a problem. Chip interference with the tool, coil or parts of the lathe could cause arcing during the induction heated runs.

Diecasting Auto Inner Door





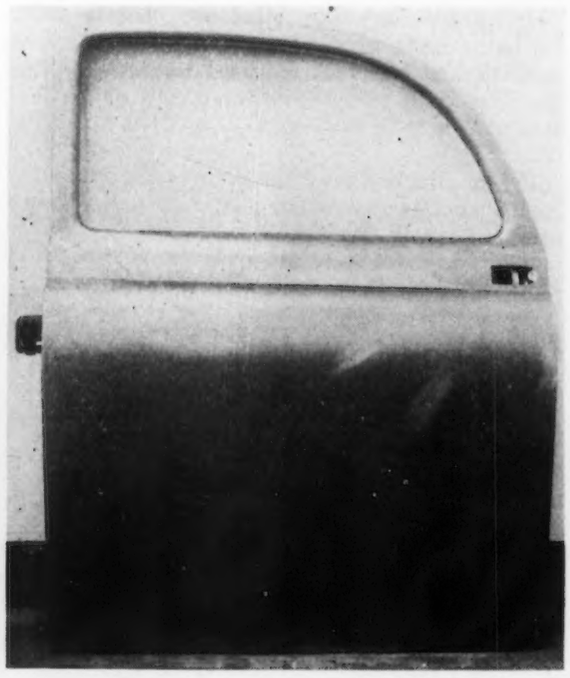


FIG. 1—General details of the diecast inner door frame are shown in the sketch, while at lower left is a view of the diecast door from the side to which the steel skin is applied. At lower right is a frame with the skin applied.

Frames in Aluminum

One of the largest aluminum diecastings to be used in an automobile, the rear door inner frame for Kaiser-Frazer cars, has been put into experimental production at the Toledo plant of Doehler-Jarvis. The castings weigh 12⅜ lb before trimming, measure 43⅜ x 33 in. and have an average wall stock of 0.10 in. Economies resulting from production use of this part include a potential saving of 34.4 lb and the elimination of as many as 16 steel stampings for a 4-door sedan.

BY W. G. PATTON
Detroit Regional Editor,
THE IRON AGE

CULMINATING several years of intensive development work, Kaiser-Frazer has completed designs for one of the largest one-piece aluminum diecastings used in the automotive industry. This casting, for the left and right rear inner door frames, shown in fig. 1, is now in experimental production at the Toledo plant of Doehler-Jarvis Corp. The casting weighs 13⅜ lb before trimming, measures 43⅜ x 33 in., and the average wall stock is 0.10 in. The complete door for installation on a car consists of this diecast frame covered with a sheet steel skin on the outside.

The development of this new aluminum-and-steel door frame is the logical outcome of the continued interest of K-F engineers in making wider use of light metal parts in its cars and is probably only the first of a number of important parts for cars which will eventually be converted to light metal parts produced by diecasting or permanent mold work.

Potential production economies resulting from the use of a diecast inner frame for passenger car doors include the saving of 8.6 lb per door or 34.4 lb for a 4-door sedan. Adoption of a diecast inner frame would eliminate four steel stampings on each door of a car, or a total of 16 stampings per car. At the present time these parts require a press line to form, trim and flange. A large welding jig will also be eliminated if the new method is adopted.

A substantial number of indirect benefits should also be realized as a result of using a diecast frame for the door. Door sizes would be more accurate; there would be no problem of spring back, and hinge locations can be held more closely than with all-steel doors. Because of a better fit and the fact that the new door is lighter, it may not be necessary to employ a large jig mounted on wheels that is now being used to assemble all-steel car doors.

Other possible advantages include (1) the use of a door pillar with less reinforcement, (2) lighter hinges and (3) safety advantages to passengers resulting from the use of a door that is substantially lighter than the present design. Accessibility for repairs is also expected to be better than the present designs. Because of the rigid die cast structural frame, the composite door has a solid ring.

Engineering and development of diecast inner door frames began at Willow Run as early as 1946. Preliminary design work occupied more than a year. The first castings, made more than a year ago as sand castings, have been undergoing tests in the K-F laboratories since that time. Doors with cast inner frames have been slammed

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FIG. 2—A set of the frame dies made by Doehler - Jarvis. Weighing 13½ tons per set, the dies have 170 ejector pins and 70 stationary cores.

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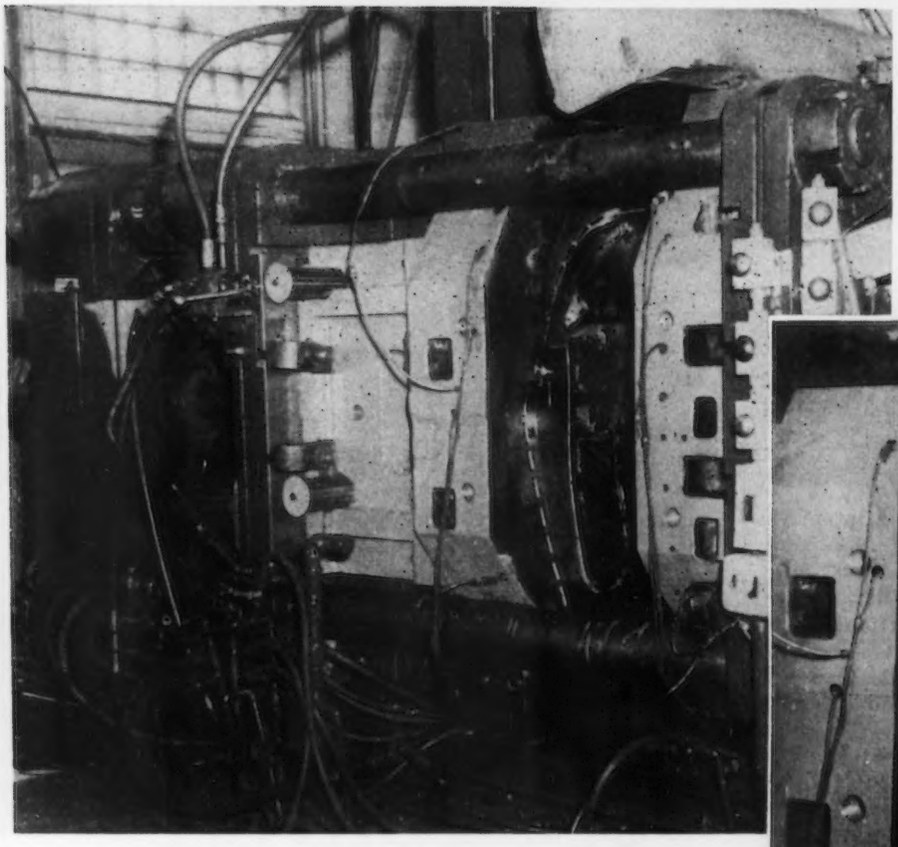

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FIG. 3—General view of the 1000-ton machine used for casting the inner door frames. Insert is a closeup of the die section.

thousands of times to locate any weakness in the design.

Present plans call for a continuation of the present experimental production of diecast door frames at Doehler-Jarvis in Toledo for shipment to Kaiser-Fleetwings at Bristol, Pa., producer of doors for K-F cars.

The method of attaching the steel outer skin to the door frame is under development, but initial runs in which the steel covering is attached in a hemming press have thus far been successful beyond the initial expectations of Kaiser-Frazer engineers. A complete door with the hemmed steel skin in place is shown in fig. 1.

Doors having diecast frames are now being tested in the field. If field tests are satisfactory, it is expected that the present experimental runs will be extended and die work for other doors will be started.

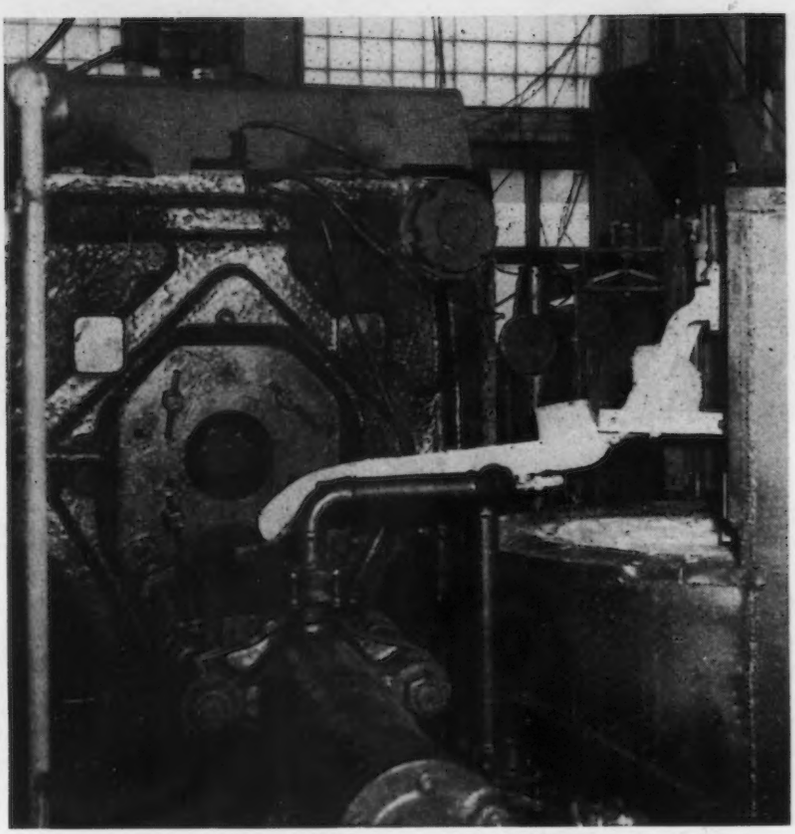

FIG. 4—Automatic ladling device which feeds a measured quantity of metal to the shot plunger. The launder is heated by gas burners.

Initially, it is anticipated that the overall cost of a steel door produced in the conventional manner and a car door with a diecast inner frame will be about the same. However, substantial savings are expected in fitting the doors in assembly.

Kaiser-Frazer research engineers admit they are studying further possible applications for aluminum diecastings in a passenger car. In general the parts being studied have relatively high fabrication costs in proportion to their material costs. By making the part as a single shot diecasting a large part of the assembly labor is eliminated. Inner frames for instrument panels and rear deck lids are examples of parts offering potential savings because of the present relatively high assembly labor.

The diecasting of this panel presented a number of problems, notably the running of the upper window section of the part and the large, comparatively thin frame sections at right angles to the die face. The steel dies for the panels (one set for left-hand doors, and one set for right-hand doors) shown in fig. 2, weighing 13½ tons per set, were the largest ever built in the Doehler-Jarvis die shops.

The machine in which the parts are cast is a cold chamber unit equipped with an automatic ladling device. This machine, shown in fig. 3, develops a locking pressure of 1000 tons.

The panel is cast in the Doehler SI alloy, a 12 pct Si alloy chosen for castability as well as strength. Casting rate on the experimental run has been approximately 50 per hr.

An automatic device (see fig. 4) ladles an 18-lb charge into a lined and heated launder which feeds into the shot plunger. This automatic device, in its essentials, consists of a ladle having a capacity equal to the 18-lb charge used for the casting. The ladle has two protrusions offset from the center line which contact a set of stops as the ladle is raised from the holding reservoir. This contact causes the molten charge to be poured at a controlled rate into the heated launder. The electric circuit activating this unit is separate from the diecasting circuit; however, it is controlled by the operator from a box located in proximity to the controls for the diecasting machine.

Dies are maintained at a uniform temperature by Calrod units. The ejector has 170 pins for ejecting the casting, while the die is equipped with 70 stationary cores. Lubricants normally used in aluminum diecastings are also used on this job.

Experience to date indicates that satisfactory die life will be obtained and die maintenance costs due to erosion or other factors will not be excessive.

The charge for each shot weighs 18 lb. Before trimming the casting weighs 13⅜ lb. The average weight of the casting, after trimming, is 13 lb. Trimming is done in a set of large trimming dies at the Doehler plant.

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FIG. 1—View of the new pattern shop at Ansonia. Benches are along the two side walls, while two duplicate lines of woodworking machinery are located down the center of the building. Dust is exhausted through an under-the-floor system.

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Foundry Modernization Program

COMPLETION of a $1 million modernization program at the Ansonia and Derby, Conn., plants of Farrel-Birmingham Co. has resulted in major improvements in working conditions and a general increase in overall plant operating efficiency. In addition to the new equipment shown in the accompanying illustrations, two recirculating ovens have been added—one for molds and one for chills. Six new pits for chilled iron roll production have also been added at the Ansonia plant. Two of these pits are 12 ft deep, two are 16 ft deep and two are 20 ft deep. An electric furnace for alloy melting and a new 86-in. cupola and auxiliary equipment have also been

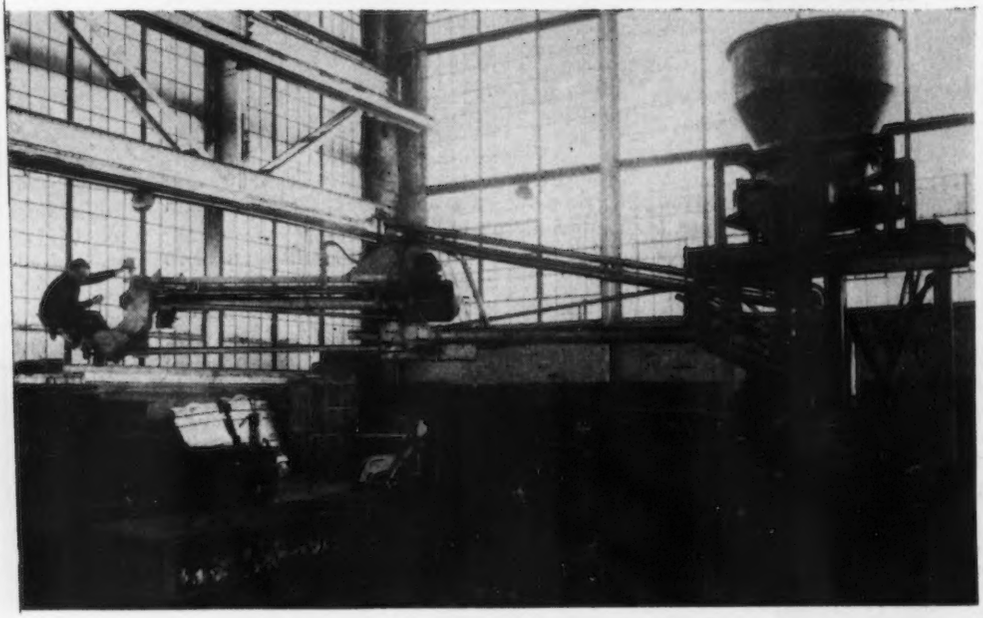

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FIG. 2—A Sandslinger has been installed in the Derby foundry for ramming up backing-up sand on large floor work. The hopper is fed by self-dumping buckets carried by the overhead crane.

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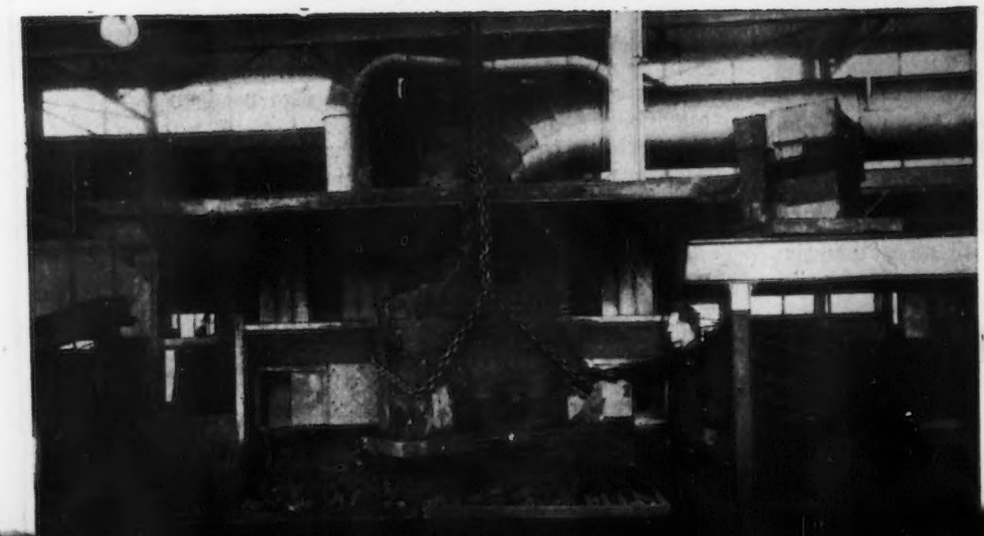

FIG. 3—A new Robbins double unit shakeout installed in the Derby foundry. This shakeout, which handles a wide variety of dry sand work, is serviced by two Roto-Clones for dust removal.

FIG. 4—View of the new sand handling system for small core work at Derby. The sand bins are filled by batch buckets carried by an overhead crane. Completed cores are moved via the floor conveyers to the ovens.

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Completed by Farrel-Birmingham

installed. The sand system installed in the Derby foundry is of particular interest since it not only provides economies through reducing new sand consumption and the labor previously required for sand conditioning, but it has also served, in conjunction with a 24-in. Roto Clone, to reduce dust counts to a very low level. Sand from the two 6-ton shakeout units at Derby is delivered to a concrete silo after passing over a magnetic pulley and through a rotary screen. Sand is drawn from the silo into a skip hoist and then into the muller where additions are introduced under close control.

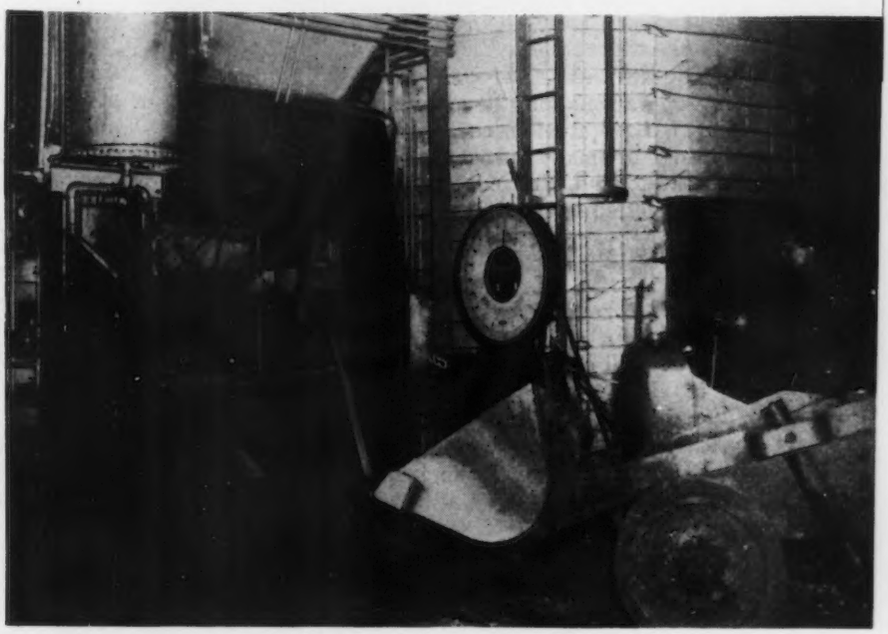

FIG. 5—Sand preparation units at the Derby plant where batches are made up with a Hough Payloader. Binder and water additions are automatically controlled. The cement silo on the right is for sand storage.

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FIG. 6—A spectrograph and auxiliary equipment has been added to the Ansonia laboratory to speed up and widen the scope of its analytical work.

Continuous Galvanizing of St

By H. W. LYNN
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Warren, Ohio

CONTINUOUS coating of strip steel with zinc possesses certain definite advantages over the galvanizing of individual sheets. An earlier paper[1] by the author discussed experiments and operations started before the war, but discontinued during the war emergency. This present article describes recent developments in continuous coating units, which confirm the earlier remarks.

The advantages of continuous coil zinc coating operations may be summarized as:

(1) Strip steel in coil form permits the combining of many processing operations, incidental to the zinc coating, including pickling of hot rolled strip, annealing of cold rolled strip in coil form, annealing and cleaning of the steel strip ribbon, and flattening either by temper mill or roller leveller.

(2) More uniform zinc coating can be produced throughout the length and width of the sheet.

(3) Elimination of the list edge and saving of spelter.

(4) Increased production over the hand feeding of sheets.

(5) Elimination of cobbling in the galvanizing rig.

(6) Preheating of the strip reduces the firing load on the kettle and pot setting and makes for better operation and increased operating speed.

(7) The shearing of material in the coating line to desired width and length and inspection at the point of shearing reduces handling cost and expedites shipment of finished product.

(8) Continuous coating of strip makes possible the combining of a chemical treatment of the coated surface for additional protection.

(9) Electrolytic zinc coating of strip can be produced on a continuous coating line with all of the previously mentioned advantages and permits this product to be competitive with other coatings.

The hot dip coil galvanizing line recently installed by Weirton Steel Co. is known as a Wean Economy line, due to the fact that this line represents a galvanizing operation as the main feature and the shearing operation is

[1] *"Continuous Hot Galvanizing of Sheets in Coil Form," 1944 meeting of the Galvanizers Committee.*

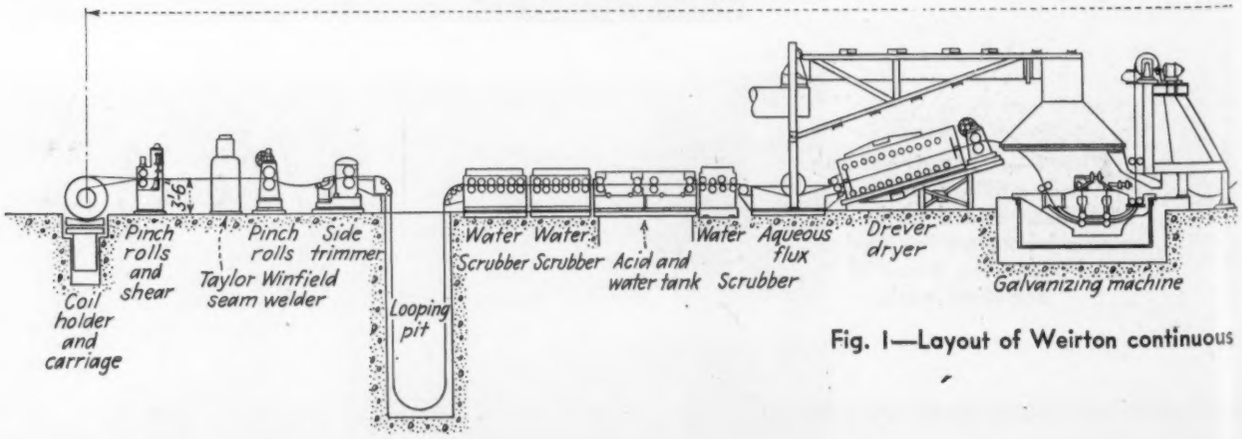


Fig. 1—Layout of Weirton continuous

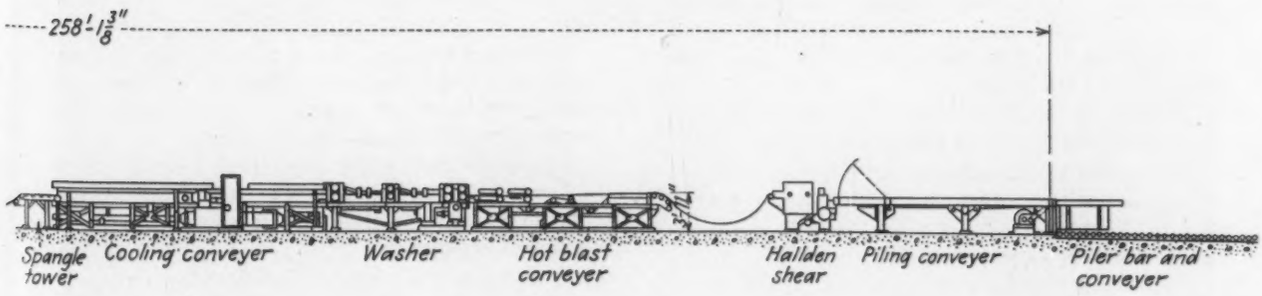
# of Strip Steel

Advantages of zinc coating strip steel by a continuous operation are outlined in this report and the author gives a description of the preliminary operations on a Weirton installation having a maximum rated speed of 300 fpm and a maximum coil width of 48 in.

Zinc coated strip emerging from the zinc coating exit rolls.

complementary to the continuous coating unit. Arrangement of the Weirton continuous galvanizing line is shown in fig. 1. The author is indebted to Weirton Steel Co. for the following information: "The galvanizing process as it is known today was patented in the United States in 1821, and until recently the method used then continued virtually unchanged. This operation was to prepare single sheets of steel and pass them, one at a time by hand, through a fluxing agent and a bath of molten zinc. Experiments with continuous hot dip galvanizing started before the war and were discontinued due to limitations on steel and zinc. Weirton's line with a maximum rated speed of 300 fpm has operated at a higher speed than any continuous coil galvanizing line and will handle material having a maximum width of 48 in., maxi-

This article is an extended abstract of a paper presented at a recent Galvanizers Committee meeting sponsored by the American Zinc Institute.—Ed.



galvanizing line for coils.

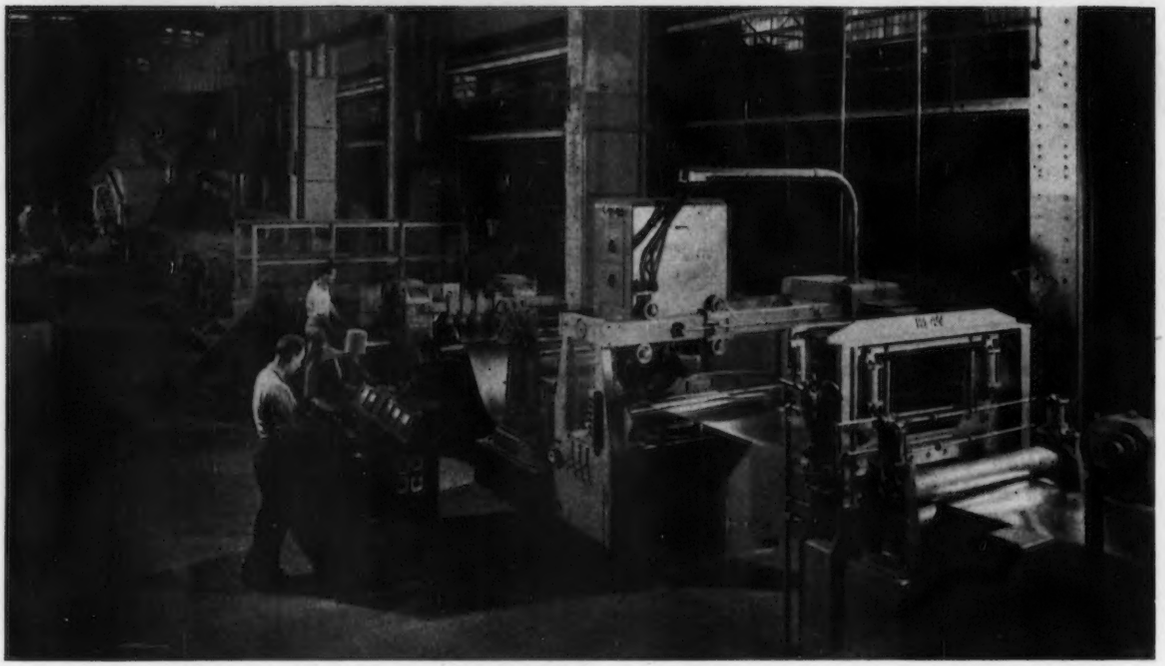


FIG. 2—Lead end of strip being fed by a pinch roll to the wheel type spot welder. The strip then passes to the side trimmer and through subsequent cleaning and scrubbing units.

mum coil weight of 30,000 lb, 18 gage and lighter. . . ."

Preliminary operations in the manufacture of galvanized sheets by the Weirton process are as follows:

Operation No. 1—After cold rolling the coils pass through a Wean electrolytic cleaner, removing oil and dirt. The electrolytic cleaning process has a maximum operating speed of 2000 fpm. The process is patented and is known as the anodic-cathodic type. The cleaning action results from the passage of about 100 amp of low voltage dc per square foot of strip from a stationary positive electrode through a cleaning solution, to the strip, and along the strip for a distance of 6 to 8 ft, and then back through the solution to the negative electrode. The gas evolution phenomena at the strip surface produced by the electrolytic action literally explodes the closely adherent oil and dirt particles from the surface of the strip. Subsequent mechanical scrubbing with rotary brushes completes the cleaning operation and the material is again coiled. The cleaner the base metal, the better the coating adhesion.

Operation No. 2—Coils are annealed in coil form to make the steel easily workable.

Operation No. 3—The coils then pass through a special rolling operation which gives a very flat surface without affecting the soft workable quality of the steel.

Operation No. 4—The coils are placed in an uncoiler for processing in the continuous galvanizing line with the following sequence of operation:

(1) The lead end of the strip is fed into a pinch roll where a shear squares the end (see fig. 2).

(2) The electric wheel-type spot welder joins the tail end of the passing coil to the lead end of the next coil and the strip then passes through a side trimming shear to be sheared to the desired width. A looping pit 50 ft deep permits continuous travel through the coating unit during the shearing and welding operation.

(3) The strip then passes through a series of scrubbing units, acid and spray tanks, making the surface spotlessly clean.

(4) The next operation consists of the strip passing through a bath of aqueous flux and a radiant tube furnace which dries the flux and preheats the strip before immersion in the zinc, as shown in fig. 3. The kettle holds a 100-ton bath of molten zinc and is fired with natural gas multiple burners. The preheating of the strip permits maintaining a constant temperature of the molten zinc bath.

(5) The coated strip emerging from the exit rolls travels a vertical distance of 20 ft over a cooling tower and down to the cooling table.

(6) After cooling, the material then passes through a final cleaning operation and into a roller leveller, which is part of a Hallden flying shear (see fig. 4) and which shears the material into desired lengths, ranging from 3 to 12 ft long. After shearing, the material is inspected prior to piling and is ready for shipment or corrugating.

The special features of the Weirton coil galvanizing line are:

(1) Operating speeds of from 120 to 240 ft per min.

(2) Simplicity of operation and low original cost.

(3) Shearing to width and length, and in-

spection of the sheared sheet in the galvanizing line.

(4) The new development of the aqueous flux unit outside the galvanized kettle and the drying of the flux in a furnace before entering the zinc bath.

(5) The preheating of the strip before coating.

(6) Production of 4500 to 4700 tons of light gage material in a 25 working day month.

(7) The operation of this line requires six men; two at the entry, two at the center and two at the exit end,

The H. H. Robertson Co., in the Pittsburgh district, have operated for several years a lead zinc Titecote unit for the purpose of coating light gage sheets. They now have in successful operation a continuous coil galvanizing line coating heavy gage hot rolled strip of 12, 16 and 18 gage. This unit is of special interest, due to the fact that it combines the pickling of the hot rolled strip coils with the galvanizing operation into one continuous operating unit, producing coils of galvanized strip.

The raw coils are uncoiled from a standard coil box and roller leveller, feeding the leading end to a shear for squaring, and then spot welding one strip to the succeeding strip. From this point the strip travel is continuous through the use of a looper car, instead of a looping pit. The strip, which has hot mill scale, then passes through three pickle tanks containing sulfuric acid and operating at a temperature of 190°F for a total length of 180 ft. After the pickling operation, all of the scale has been removed and the strip is washed with hot water before entering a muriatic acid bath prior to galvanizing.

The galvanizing unit is of the Wean Titecote lead zinc process. The kettle is 14x7 ft, and the galvanizing rig is of the standard design. The pot setting is gas-fired with multiple burners and has a heating capacity of 12 tons per hr of galvanized strip. The travel through the lead bath heats the strip prior to coating and gives excellent adhesion of the zinc, as the strip passes through the exit rolls, which are running in a bath of zinc.

Emerging from the exit rolls, the strip passes upward in a vertical line approximately 40 ft, and around a large diameter roll, reversing the direction of flow for a distance of approximately 200 ft. This space provides ample cooling time before the strip enters an upcoiler for coiling the coated material. A shear is placed in front of the coiler for cutting the strip, and removing the welded section. The average operating speed of this line is 50 fpm, on 16 gage, and the production averages 10 tons per hr. A special feature has been the development of a stainless steel flux box, fabricated of type 316 stainless steel (Cb stabilized) $\frac{3}{8}$ in. thick. This flux box has given unusual length of life, and the writer observed one unit that was still in operation after being used for 6 months.

The coiled material produced on the continuous pickling and galvanizing line is coated with zinc to protect the strip against rust during the cold forming operation and subsequent shearing operation producing fabricated steel floor beams. The zinc coating also permits a good

FIG. 3—Aqueous flux bath and radiant tube furnace which dries the flux and preheats the strip prior to immersion in the zinc.

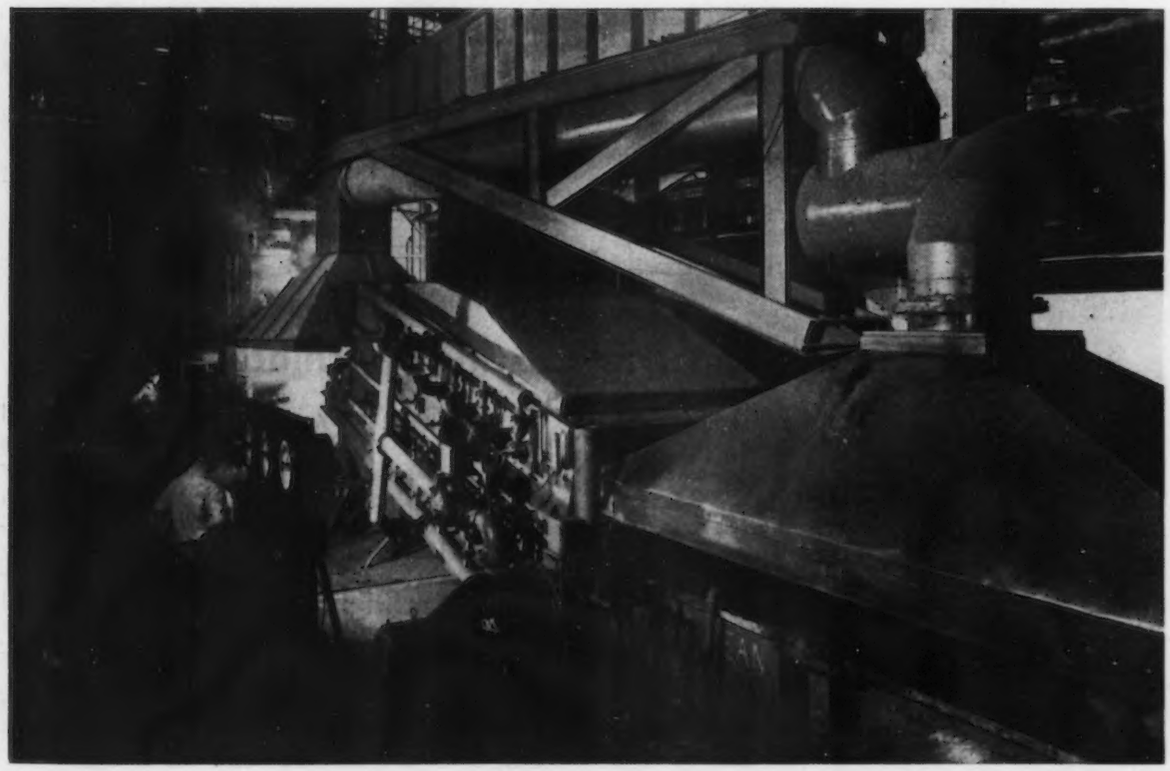


FIG. 4—Cooling and drying conveyer with the Hallden flying shear cutting the strip into sheet lengths.

application of paint by the ultimate user of the fabricated product.

Wean Engineering Co. has just completed the installation of another continuous light gage galvanizing line in the Pittsburgh district which is in successful operation. The processing line consists of equipment for the handling of coils of cold reduced strip steel, welding succeeding coils to make a continuous ribbon for processing operations at a maximum speed of 300 ft per min.

This line is equipped with a vertical electric annealing and heat treating furnace and the necessary gas atmosphere equipment. The continuous coating unit is used in connection with facilities for either coiling on the line or cutting to length with a flying shear and piling the sheared material after inspection.

The zinc coating of cold rolled strip steel by the electrolytic process has continued to expand and the units operating in this country are producing material up to 38 in. wide, 24 to 36 gage, at operating speeds ranging from 125 to 150 ft per min, depending on the capacity of the electrical generators. The product can be chemically treated or lacquered, for many special applications such as bottle tops, closures, stoves, and articles manufactured for display purposes.

The summary of the continuous coating of strip steel indicates that there are many economies in this manufacturing process which permit the capital investment to be recovered within a reasonable period of time.

The synchronizing through electric control of the various units facilitates satisfactory operation and relieves the operating personnel for other important functions in the line.

Magnesium Die Casting Machine

MAGNESIUM castings of 2 and 3 lb weight, which were produced in Germany during the war on a fully-automatic casting machine, are deserибed in a report by the U. S. Office of Technical Services. The Mahle die casting machine is a hot chamber injection design. This machine was recently made available for inspection at the Frankford Arsenal in cooperation with the American Die Casting Institute.

Some observers of this machine, according to the report, felt that if a fully automatic die casting machine with a device to protect the operator from molten magnesium could be designed using principles of the Mahle machine, a more uniformly high quality output might be achieved than is now possible. Particularly worthwhile would be the use of high hydraulic pressure for all operating and locking pressures of the press, as well as for operating and locking the cores, and for ejection of the castings.

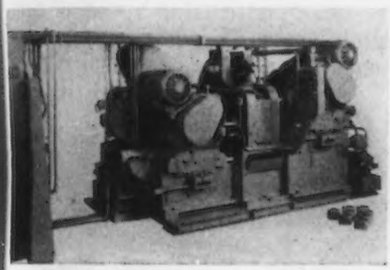
The report further suggests that the construction of dies utilizing fabricated base plates and cylindrical screw-in lugs is an economical measure which may find application in the construction of dies for plastic molding.

Copies of the report (PB 97113) are available from the Office of Technical Services, Department of Commerce, at $1.50 a copy.

New Production Ideas . . .

New and improved equipment featured this week includes: A special machine for taper reaming, chamfering and tapping pipe couplings, drilling, milling, and threading machines, a tube bender, adjustable expansion blades, face mills, lathe toolholders and centerless shaft supports, wear strips, a vibrator, a relaxation testing machine, and vacuum seam testers.

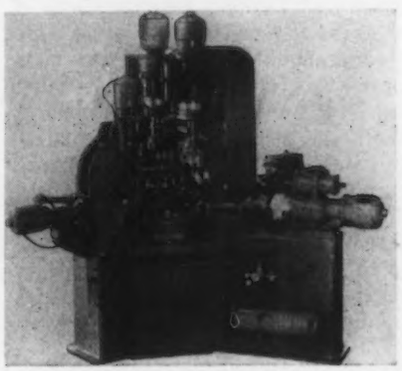
A SPECIAL, two-way, four-unit, horizontal, hydraulic feed machine has been built for taper reaming, chamfering and tapping 2½, 3 or 4-in. pipe couplings. A six-station,



manually operated, trunnion type fixture holds the work. Jaws of suitable dimensions are inserted in the clamping vises for holding each size of pipe coupling. Reaming and chamfering are performed by combination tools with dwell for chamfering. Tapping units advance hydraulically to the work and go into lead-crew feed for tapping. Collapsing taps allow hydraulic rapid withdrawal of taps from the work. A motor driven, impeller type pump supplies cutting lubricant to all the tools. Control of the electrical and hydraulic functions of the entire machine is concentrated in a push button station. A green indicator light indicates to the operator that the particular unit is set in the correct position to begin cycle of operation. *Moline Tool Co. For more information, check No. 1 on the attached postcard.*

Drill Units

THE new No. 5 model drill unit for drilling, centering, countersinking, facing and milling operations is powered by a combined air-hydraulic system, available in 2 to 5 hp. The air-hydraulic system incorporates a sealed unit construction that permits operation in any position. Design follows practice of grouping single units in welded bases to meet changes in design of the workpiece. The drill spindle thrust is provided by the plant's air system or auxiliary supply. Operating principle is based upon a rapid advance to an accurate positive stop, then metered hydraulic feed to another positive stop, and rapid return. The drill passes rapidly down through the previously drilled portion of the hole to within a few thousandths of the bottom before assuming feed rate of travel.



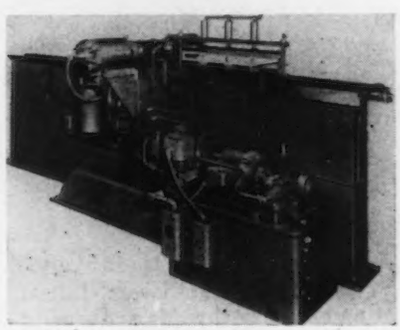
Stop also leaves bottom of the hole accurately located for next station. The spindle is normally furnished with a No. 4 Morse internal taper and quill is designed to be adaptable to multiple spindle drill heads. *Cleveland Republic Tool Corp. For more information, check No. 2 on the attached postcard.*

Wear Strips

ALUMINUM-BRONZE wear strips for use on boring bars and driving tools piloted in bushings will practically eliminate seizing and galling caused by high speeds, heavy loads and adverse operating conditions. They are cast from Ampco Metal Grade 21, have a low coefficient of friction and good heat conductivity. The wear strips are available in 6-in. lengths and five standard sizes of ⅜, ½, ⅝, ¾ and 1 in. All are 6-hole type, cap screws furnished. *Scully-Jones & Co. For more information, check No. 3 on the attached postcard.*

Duplex Milling Machine

THE principal design feature of a new high-speed, duplex milling machine for use in the mass production of light metal parts is the positioning of the cutter heads to permit simultaneous parallel face milling on any two opposite sides of a piece. Cutters are driven by two opposed motors, mounted horizontally. Work is placed in a holding fixture mounted on a planer-type table that feeds the work to the cutters. Clamping is done pneumatically, either manually or automatically. In automatic clamping the air clamps are interlocked with the feed cycle and closed when work travels between cutters. Automatic return stop may be set



at any predetermined point, depending on the length of cut. Motors may be adjusted for horizontal travel up to 1½ in. and vertically up to 2 in. Maximum work dimensions are 58 in. long x 5¾ in. high. Feed is infinitely variable up to 25 sfpm with table return maximum of 40 sfpm. Cutters up to 6 in. diam may be used.

Motors are 5 hp, 3600 rpm, 60 cycle, 3 phase, 220/440 v. *Onsrud Machine Works, Inc. For more information, check No. 4 on the attached postcard.*

Drill Presses

A NEW line of 15-in. drill presses consists of seven models, bench and floor types, in tilting table or one, two, three, and four spindle production models. Chuck capacity ranges from No. 70 to ½ in. Jacobs chuck with No. 1 Morse taper is optional. The press is of rugged construction, precision machined throughout, and has a 2 3/64 in. quill. Its 4½ in. stroke, with a shorter, six spline spindle, is said to permit greater bearing support and rigidity, and give improved accuracy. Quill and column bearings, line bored in one opera-

tion, also provide greater machine trueness. Spindle speeds range from 625 to 4800 rpm in standard models, and from 490 to 3000 rpm on Slo-Speed models. With the Famco speed-reducing attachment spindle speeds as low as 185 rpm may be obtained. *Famco Machine Co. For more information, check No. 5 on the attached postcard.*

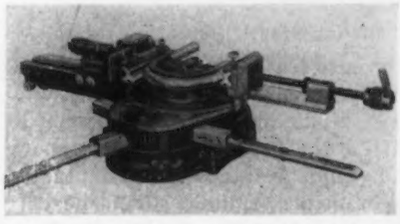
Pipe Threading Machine

FASTER working speed, automatic chucking, lower initial cost and cleaner threads are among the advantages claimed for a new 44-in. pipe threading machine known as the Thread-O-Matic 44 in. Range of this machine is from ½ to 4 in. With mechanically operated automatic chucks the manufacturer states it is only necessary for the operator to lay pipe in the spindle and turn a switch to chuck, center and turn the pipe. The cutter is mounted on the front housing to allow the operator to place a fitting on the pipe immediately after threading. The thread-length gage has been eliminated and a red blinker substituted, that flashes every two revolutions. The operator starts thread on first flash and

threads until five flashes are counted before the die head is opened. This is said to result in a perfect thread length. *Quijada Tool Co. For more information, check No. 6 on the attached postcard.*

Hand Tube Bender

MANUALLY operated, a production tube bender recently announced handles tubing up to 3 in. diam. Known as the Model 848, it accommodates thin or heavy wall copper and aluminum alloy tubing and light or medium gage annealed steel tube. The bender is operated by hand levers, actuating a central spindle and the attached radius block through gearing. Ratios of 30:1 or 8:1 may be chosen. Bends up to 180° may be made, including offset bends and U-bends in the middle of long tubes. The machine



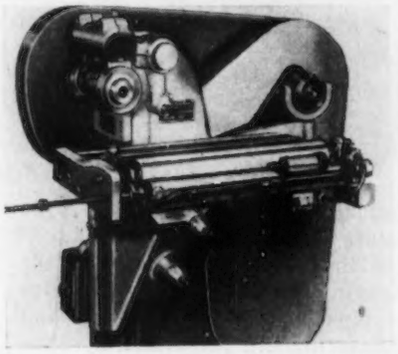
is reversible, and tube clamping and radius forming assemblies may be mounted on either side. Successive right and left hand bands can be made. Bend radius ranges from 1¼ to 12 in. *Parker Appliance Co. For more information, check No. 7 on the attached postcard.*

Broaching Calculator

A SLIDE rule type calculator for rapidly determining force required for broaching cast iron, steel, bronze, aluminum, magnesium or plastic parts is applicable to surface broaches or round, spline, serration and keyway broaches. It can be used to check the suitability of a broaching machine for any given job, capacities of machines required, etc. The instrument measures 3x6½ in. and is printed in four colors to simplify reading of the 12 separate scales and three tables provided for calculations. *Colonial Broach Co. For more information, check No. 8 on the attached postcard.*

Milling Machine

A NEW air-hydraulic feed milling machine has been developed for high speed semi-automatic production, with an 18-in. powered longitudinal table travel. The table travel speed is adjustable in both directions and cutting speed is infinitely variable. The automatic pneumatic table feed provides rapid

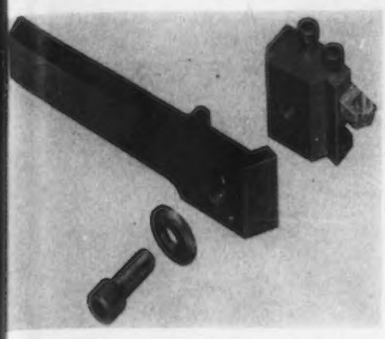


approach, adjustable feed and rapid return. A smooth cut is achieved by the air-cylinder operating against the hydro-check valve. This new Air-Hydraulic No. 1 U. S. milling machine is said to add speed and efficiency of automatic power feed to the rugged quality, accuracy and economy of the basic No. 1 U. S. milling machine. *U. S. Machine Tool Co. For more information, check No. 9 on the attached postcard.*

Lathe Toolholder

HAVING true vertical adjustment for turning, facing, threading, boring and cut-off operations, a new lathe toolholder consists of a shank for standard toolposts with three heads for mounting tool bits, cut-off tools and boring bars. The shank and heads are so made that they provide quick and easy adjustment of the heads on a true vertical plane so that the cutting edge is exactly on center and yet maintains a perfectly horizontal position. All parts of the

toolholder are precision machined from high quality steel, case hardened 1/32 in. deep to 60 Rc. The shank is centered in relation to the



head so that it may be used either right or left for turning and cutoff operations. Toolholder sets are available in three sizes. *Brand Tool & Supply Co. For more information, check No.* 10 *on the attached postcard.*

Clutch Speed Counter

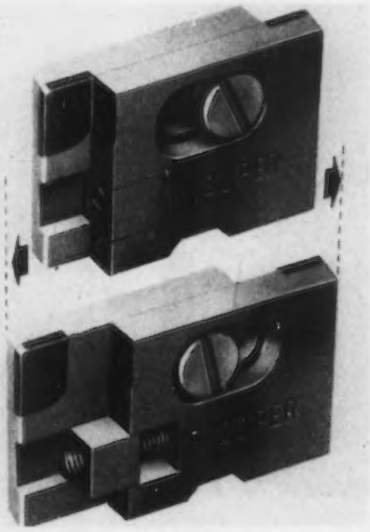
FOR a constant efficiency check on the rotating speeds of motors, generators, machine spindles and other equipment with revolving parts, a new clutch speed counter has been developed. The instrument counts to 10,000 and repeats, and the rpm's are timed by using any watch with a second hand. The unit measures 3¼x⅞x⅞ in. and may be carried in the operator's pocket. Maximum speed recommended is 2500 rpm, intermittent. *Veeder-Root, Inc. For more information, check No.* 11 *on the attached postcard.*

Centerless Shaft Support

EASY and accurate centering in the lathe of any shaft from ¼ to 1 in. diam is claimed for a chuck designed to support centerless shafts concentrically in lathes. Known as the Adjustable Collet Bushing Chuck, it is manufactured with No. 2 or 3 Morse taper shanks for use in either the headstock or tailstock spindle of the lathe. Brass collet chucks can be supplied for round stock in sizes from ¼ to 1 in. by 16ths. A special size collet of 0.637 round capacity is available for chucking popular types of automobile generator armatures with shafts of this size. *South Bend Lathe Works. For more information, check No.* 12 *on the attached postcard.*

Adjustable Expansion Blade

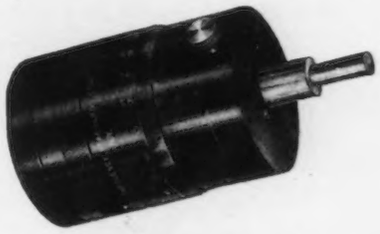
A NEW carbide tipped adjustable expansion blade for standard reamers and boring bars has been



announced. Standard sizes range up to 4 in. *Super Tool Co. For more information, check No.* 13 *on the attached postcard.*

Micrometer Head

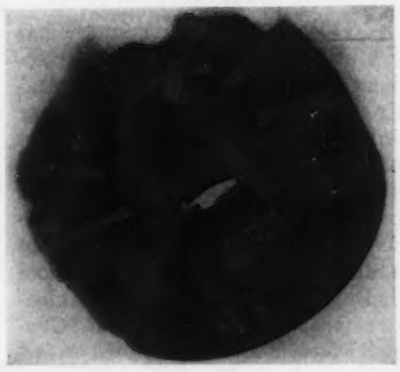
DEVELOPED particularly for the electronics industry, a new type of precision micrometer head features an anti-backlash screw thread which compensates for thread wear and provides a positive spindle reading in either direction of rotation. Temperature compensation is accomplished by use of both an Invar spindle and nut, the spindle threads being hard chrome and the nut threads silver plated to provide good wearing surfaces. Readability is made positive by use of yellow colored scales against contrasting black anodized aluminum. The head is available in either English or Metric scales with both 1 and ½-in. thread travel offered in both. It may be clamped



or flush panel mounted and features positive spindle lock and a convenient means of resetability for calibrated instruments. Vernier scales are used on all models. *Frequency Standards Corp. For more information, check No.* 15 *on the attached postcard.*

Face Mills

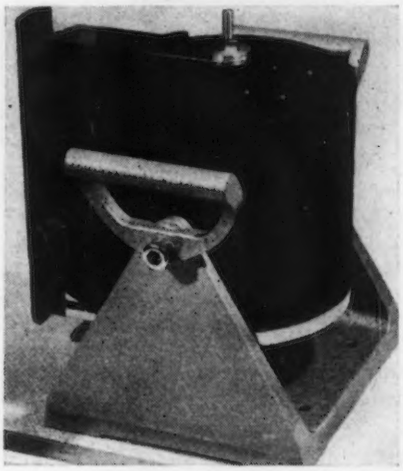
THE main feature of new face mills, designed to combine the stock removal qualities of brazed on and serrated blade tipped cutters with the economical regrinding features of the solid carbide bladed face mills, is a large carbide tip with sufficient steel backing to effect the addition of serrations to the back of the blade. The amount of steel brazed to the carbide is said to be negligible and the carbide tip remains the dominant material to eliminate the tendency of bi-metal cracking of carbide under thermal



strains. Positive locking of the blade in the cutter is effected by a hardened tool steel serrated wedge behind the serrated blade. Blades are removable from cutter body for regrinding. Up to 90 pct of the carbide can be consumed, it is claimed, before blade replacement is necessary. *Viking Tool Co. For more information, check No.* 16 *on the attached postcard.*

Vibrator

FURNISHED with carrying handles and trunnion support, the Model 6 electro-dynamic shaker has been designed specifically to give a high force output for its size and



weight. It has been developed for generating oscillatory testing, fatigue strength determinations and in other applications where large vibratory forces over a wide frequency range are required. Maximum force rating, at any frequency, is ±25 lb. Power output at 60 cycles per sec is ⅜ hp. Total weight with trunnion base and handles is 60 lb. Dimensions are 11¼x9x10-in. without handles. *Calidyne Co. For more information, check No.* 17 *on the attached postcard.*

Electronic Counter

AN electronic pulse counter has been designed for special applications calling for precision measurement over a wide range of very high rotating speeds. Equipment consists of a high-frequency pulse generator or pick-up, an electronic counting circuit, and two speed indicating units, one for on the spot readings and the other for remote readings. Counters available measure speeds up to 17,000 rpm. *General Electric Co. For more information, check No.* 18 *on the attached postcard.*

Creep Testing Machine

RELAXATION tests at temperatures up to 1800°F can be carried out automatically, including a record of the rate of decline of load, by means of a new 4000-lb capacity machine. Relaxation occurs when a material is stretched to, and held at a given elongation, as in bolts, particularly at elevated temperatures. Creep tends to elongate the bar and release the load. Elastic shortening balances this effect and total strain remains constant. Plastic elongation can be measured by the decrease in stress. Relaxation tests are also useful beyond the direct application of data on the behavior of metals at constant total strains. They establish the relative ability of a material to withstand stress at high temperature. They also estimate creep values in certain ranges of stress and temperature for high strength alloys and in predicting mechanical properties of metals at high temperatures. The recorder produces a curve of stress v. time on a flat

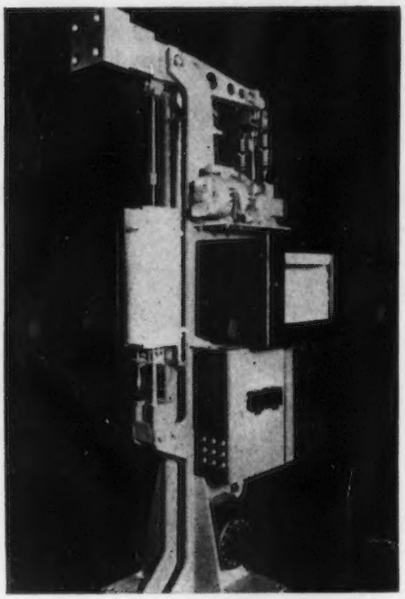
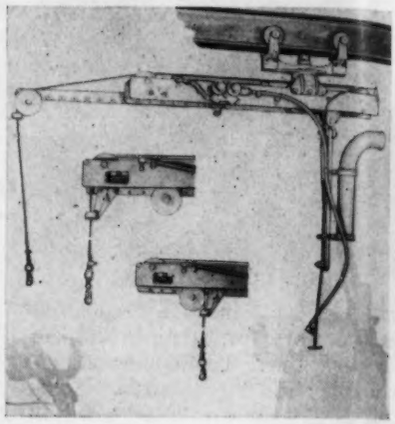


chart slightly less than 10 in. wide. The furnace is 18½ in. long, 8¼ in. OD, and 2½ in. ID. It may be controlled within 5°F or less depending upon the controller used with it. The machine has a welded steel frame. *Baldwin Locomotive Works. For more information, check No.* 19 *on the attached postcard.*

Welder Gun Balancer-Hanger

A PORTABLE welder gun balancer and hanger balances a welding gun in any position in the balancing range without any up or down creep, and can be moved up or down with the slightest pressure. It is a complete unit with trolley and operates on a 4-in. Standard I beam. The operator is free to spot weld any operation without drudgery, whether in an up or down, right or left movement or stationary. The hanger has a transformer mounting bracket adjustable from 1½ to 9 in. off center of main supporting bracket for counterbalancing overhanging weight of welding gun and cables. A swivel conduit tube



holds the input and exhaust water hose, control wires to transformer and air or hydraulic hose to welding gun. The hanger revolves 360°. The support arm allows welding gun adjustment of 21 to 60 in. from the transformer. The welder gun balancing range is 52 in., manufactured in sizes to balance from 10 to 150 lb. It operates on 100 lb air line pressure. *Platz Co., Inc. For more information, check No.* 20 *on the attached postcard.*

Lifting Boom Attachment

A LIFTING boom for handling engines, long bars, bulky and odd-shaped material has been added to the line of accessories available for the Buda 5000-lb capacity at 20 in. load center Model F-50 fork truck. It is readily interchanged with the forks and attached to the carriage in the same manner. The swivel hook can be positioned in six positions on the lifting boom for carrying various loads or used with another swivel hook for lifting bulky equipment. *Buda Co. For more information, check No.* 21 *on the attached postcard.*

Control Valves

SUITED for use with manually controlled presses, pilot circuits, and processing cycles when frequent manual operation is required, a new line of small single plunger valves feature simple design, sturdy construction, and easy operation. The valve has an aluminum housing, a hollow stainless steel plunger with precision placed

The costs to machine this brass pump housing aren't excessive (simply spot drilling, boring, facing, chamfering) — until it comes to drilling the 4 holes in the flanges. There's the rub: *extra* handling . . . and *extra* costs. P&J Tooling on the P&J Automatic solves the cost problem with tungsten carbide tooling, and . . .

THE P&J-DESIGNED SELF DRIVEN MULTIPLE SPINDLE DRILLING ATTACHMENT which is automatically indexed into exact alignment — to drill and c'sink the 4 holes in one operation while the work spindle revolves. Machining time is reduced . . . unnecessary work-handling eliminated. Good points to remember!

Of course no two jobs are alike. P&J engineers will gladly apply their 50 years' tooling experience to *your* job. A time study and cost estimate are yours for the asking. Simply send details and a sample part or prints.

P&J AUTOMATICS

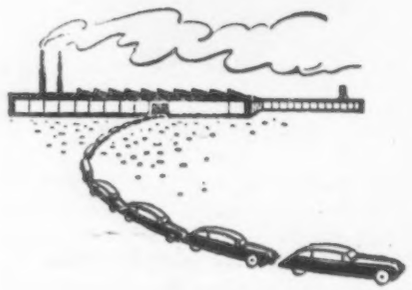
Potter & Johnston Company
Pawtucket, R. I.
subsidiary of Pratt & Whitney
Division Niles-Bement-Pond Company

P&J

Assembly Line . . .

WALTER G. PATTON

• Buick is using cut wire shot to peen its coil springs . . . Wire cut shot permits large savings . . . Pontiac announces new engineering building . . . Olds doubles its engine capacity.



FLINT — The use of shot peening to improve the life of automobile parts subject to fatigue failure is one of the outstanding developments of the industry in recent years. At the June meeting here of the Iron & Steel Technical Committee of the SAE, H. H. Miller, research metallurgist of the Buick Motor Div., described the results of a successful application of cut wire for peening coil springs. A detailed report of the tests will be available at a later date through the SAE, showing the advantages of this new type of peening material.

As compared with chilled cast iron shot formerly used for the purpose, the number of Buick springs peened per lb of shot was increased from 7.45 to 75.77. Shot cost per spring was cut to one-third of the former cost. Maintenance labor was reduced substantially and maintenance material was cut in half. Total cost per spring of the peening operation was reduced to less than half the former cost.

In addition to large cost savings and substantial improvement in control of the peening operation, fatigue life of coil springs was increased from slightly less than 500,000 cycles using cast chilled shot to a life in excess of 1 million cycles where cut wire shot was used.

In the paper, Mr. Miller pointed out that before shot peening was used, Buick coil springs were made from four-pass ground bars. This amount of grinding was considered necessary to remove surface defects. The fatigue life of these springs was less than 100,000 cycles.

WITH the introduction of shot peening it was found possible to use one-pass ground bars. In addition to the reduction in the amount of grinding necessary, it was also possible to reduce the amount of steel used in the coil spring. With the improved fatigue life made possible by the use of cut wire shot, Mr. Miller indicates that further savings in processing cost may be possible.

The cut wire shot used in the Buick test is MB hard drawn mechanical spring wire with 0.45-0.70 carbon content. Experience to date is with 20 gage (.0348 ± .001 in.) hard drawn wire. The wire is purchased to a specification of 261,000 to 301,000 psi.

Peening tests were conducted using equipment produced by American Wheelabrator & Equipment Corp.

As supplied, the cut wire shot has sharp edges and a break-in period of 4 hr bombarding scrap material is used. Small day-to-day additions of shot are made as required.

The wire cut to length equivalent to its diameter deforms in use into a spherical shape of uniform size. The size is maintained during use and the tests show remarkable life for the new material, according to the author.

As mentioned earlier, the tests show approximately one-tenth of the production usage experienced with chilled cast iron shot.

Mr. Miller's paper also disclosed that the Buick axle shaft is being cleaned by blasting with cut wire shot and that arrangements have recently been made to blast the Buick clutch spring with shot made from cut wire.

The paper also mentions that malleablized cast wire shot and cast steel shot offer interesting possibilities for improving the methods in use today for peening operations.

•

Olds Doubles Its Engine Capacity to 60 Per Hour

Detroit

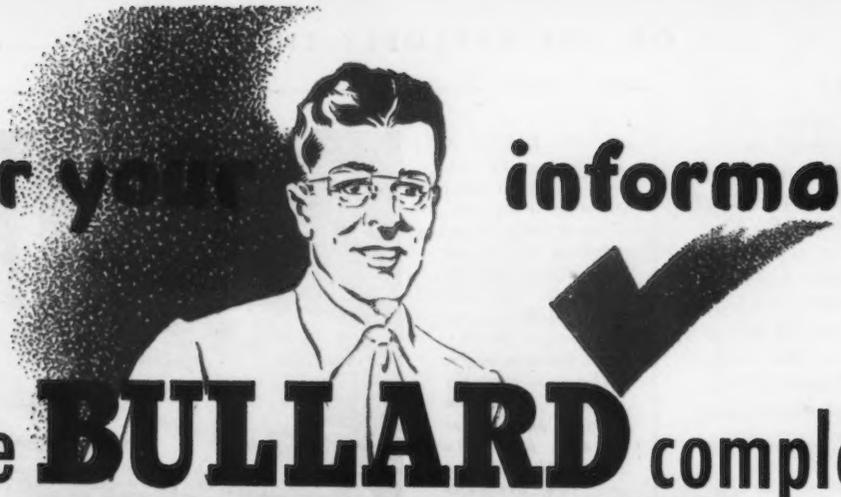
• • • **GM's growing** confidence in its high compression engine is indicated by the fact that early next month the capacity of the new Olds engine plant at Lansing will have been raised from 30 per hr to 60 engines per hr.

The favorable reception of the new "Rocket" engine was not unforeseen by GM officials. According to machine tool sources here, as much as 70 pct of the equipment originally installed at Lansing had a capacity of at least 60 engines per hr. Thus, it was only necessary for Olds to increase the capacity of certain tight spots in the line to double the present output.

Expansion of the Olds plant has been going on quietly since last winter when the decision was publicly announced that the engine plant capacity would be doubled.

In carrying out its new plans, Olds processing engineers made the same ingenious use of scale models and miniature layouts which permits complete visualization of the entire operation. After the layout was completed and approved, equipment purchases were made. Next, delivery schedules were arranged into a tight time-table.

All the latest changes have been made without any loss in the production of Rocket engines, according to Olds officials. Some equipment had to be moved temporarily into the aisles of the plant. To a considerable extent, arrangements were made to work on Saturdays, Sundays and holidays where it



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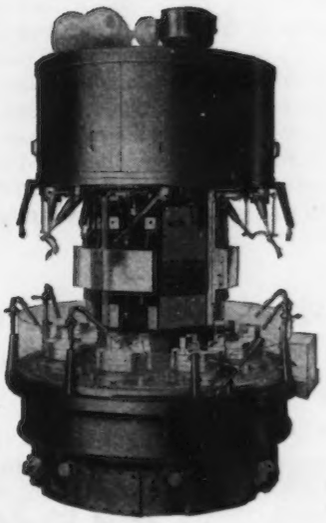
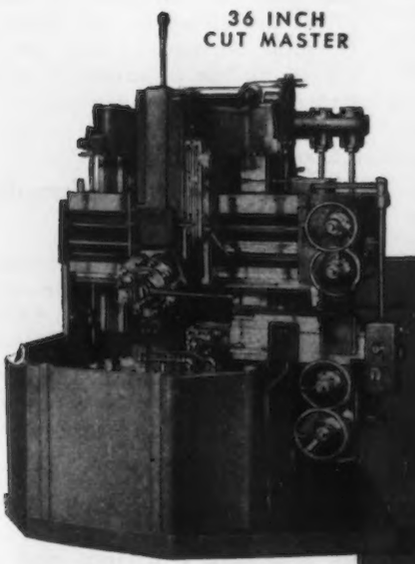
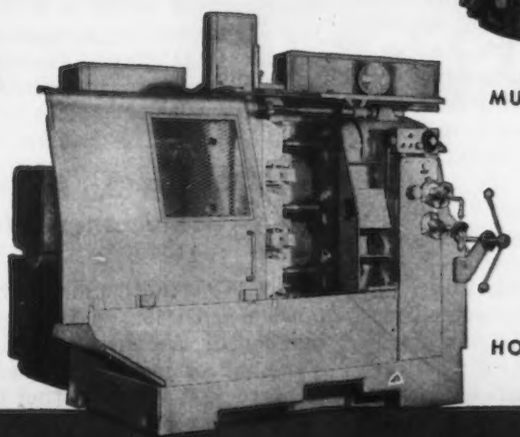


TYPE "D"
MULT-AU-MATIC

BULLARD

36 INCH
CUT MASTER





30-H
HORIZONTAL
LATHE

THE
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would not interfere with the present two-shift operation of the plant.

In the process of doubling its capacity, Olds has added 80,000 sq ft to the plant, bringing the total area now in use up to 246,000 sq ft. The conveyer system of the enlarged plant now exceeds 4 miles and the engine assembly line is 476 ft long.

Some idea of the amount of metal cutting that goes on in the Olds engine plant may be gained from the fact that the chip conveyer system is now capable of removing 4 1/3 tons of iron chips per hr.

In addition to doubling the capacity of its engine plant, Olds is converting two existing buildings into a new final assembly plant. The new plant will have a capacity of 80 cars per hr. Adjacent to the assembly plant will be a new car conditioning plant and a marshalling area to facilitate driveaways.

It is quite apparent to observers here that all automobile plants are anticipating a larger percent of the new cars sold will be driven away from the factory. Increased freight rates is a major factor contributing to this situation, according to automobile sources.

•

Pontiac Will Construct New Engineering Building

Detroit

• • • **Following by less** than a week ground-breaking for the new GM Technical Center on Mound Road, Pontiac Motor Div. has announced it will construct a new two-story engineering building comprising 213,645 sq ft of working area. The new building will be located in Pontiac adjacent to the present Pontiac manufacturing facilities several miles northeast of downtown Pontiac. Construction is expected to begin early this fall.

It has been known for some time that Pontiac has had a new engineering building in its postwar planning but construction details and equipment plans have been a closely guarded secret. Albert Kahn Associated Architects & Engineers, Inc., Detroit, designed the new building.

The first floor will contain, in addition to offices and engineering laboratories, space for the trial assembly of new model cars including the necessary machine, sheet metal, paint and wood-working shops and stock rooms.

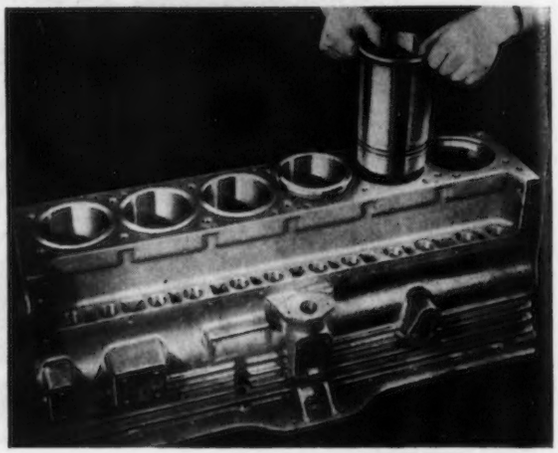
Other features include a complete engine and chassis dynamometer laboratory, a carburetor flow room, an instrument laboratory, and transmission testing and stress laboratories.

An innovation in the new building will be a copper-walled room where radios can be tested in complete isolation from outside signals.

The second floor of the new building will include a 700 seat auditorium and a stage to be used for sales gatherings and departmental meetings. Elevators for moving cars to be displayed and a turntable for exhibiting them have been included in the new design.

The remainder of the second floor will contain a 10,700 sq ft drafting room, photostating equipment and specification offices. These quarters will have air conditioning and forced ventilation.

JUST LIKE A DIESEL: *In its new Gold Comet gasoline engine, Reo engineers have adopted the "wet sleeve" cylinder principle, permitting cylinder replacement quickly and inexpensively. Other advantages include uniform section and better piston fits. An overlapping gasket and two neoprene seals keep the sleeves permanently watertight.*



•

K-F Employees Receive Insurance Benefits

Detroit

• • • **With the emphasis** on 1949 labor negotiations heading unmistakably in the directions of pensions and/or insurance benefits for employees, it is interesting to note that Kaiser-Frazer, sole car producer at present having an insurance contract with the union, is now paying out through its social security fund benefits to employees at the rate of more than a million dollars per year. The number of employees involved is a little less than 16,000.

K-F increased its benefits last February. Approximately 82 pct of the workers at Willow Run, Detroit Engine Div. and the Dowagiac and Adrian plants are covered under the plan. The fund is administered jointly by K-F and the union.

Under the present agreement, K-F contributes to the insurance fund at the rate of 5¢ for each hour worked by participating employees. The fund accumulated in this way provides workers with $30 per week in the case of nonoccupational injury; maternity benefits up to $180; $2000 death benefit; semi-private room hospital care up to 120 days and the usual surgery and operating room benefits.

Benefits are available to the employee and members of his family under 19. If the employee leaves the company, the insurance program, except disability benefits, can be continued by making payments direct to the insurance company. Hospital care and surgical benefits may also be continued by paying premiums direct to the Michigan Hospital service. There are, of course, no loan or surrender values under the insurance contract.

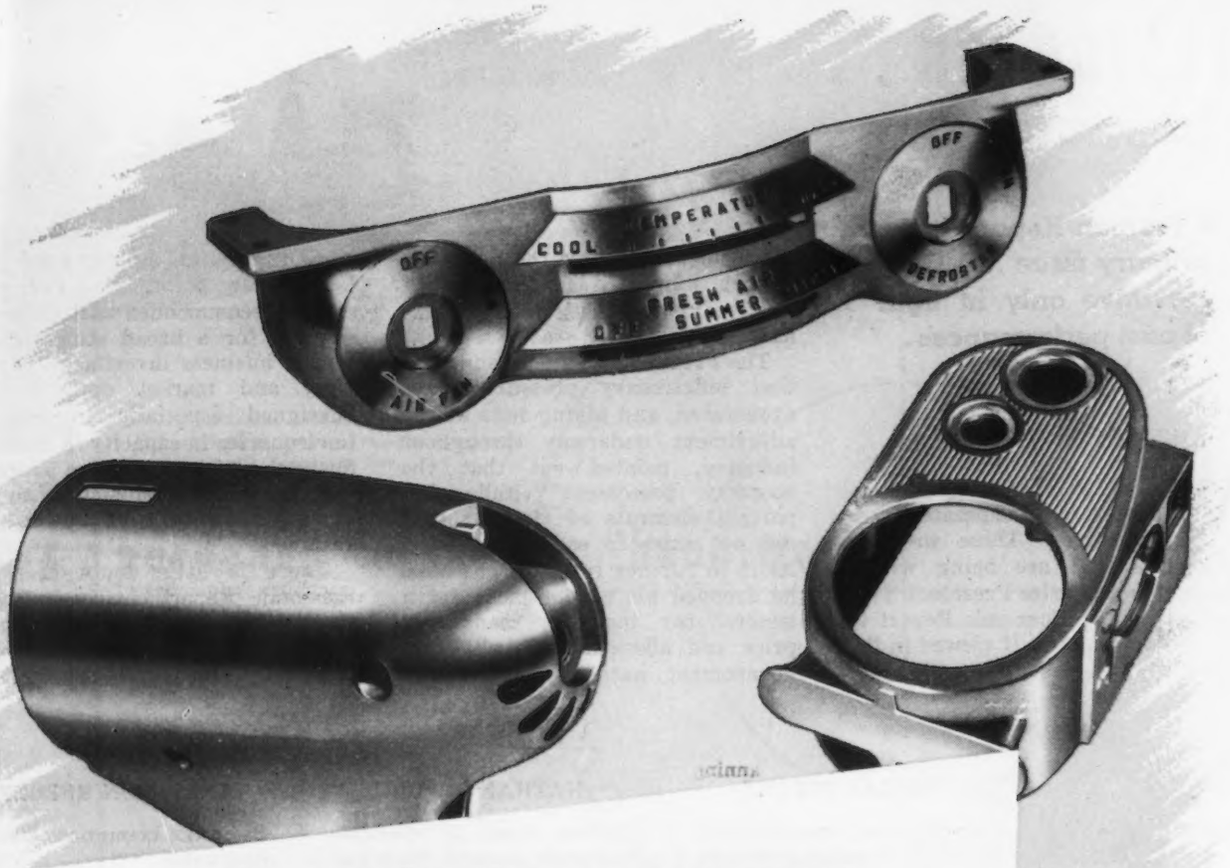
•

New Coupe for Oldsmobile

Lansing, Mich.

• • • **Another** of the automobile industry's new glamour cars, Oldsmobile's "Holiday Coupe" made its debut recently. Having the lines of a convertible, the new Holiday Coupe has a rigid steel top. Support pillars between the top and the lower portion of the body are eliminated. The new car has ultra luxurious interior trim.

Buick announced recently that its new luxury Riviera model is listed at $2985, f.o.b. Flint.



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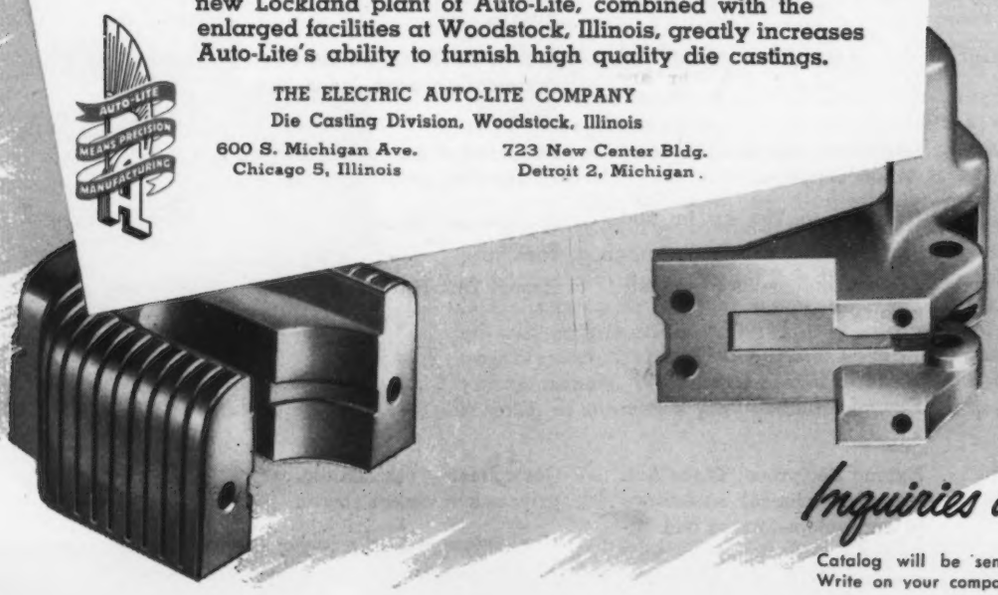

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Washington . . .

EUGENE J. HARDY

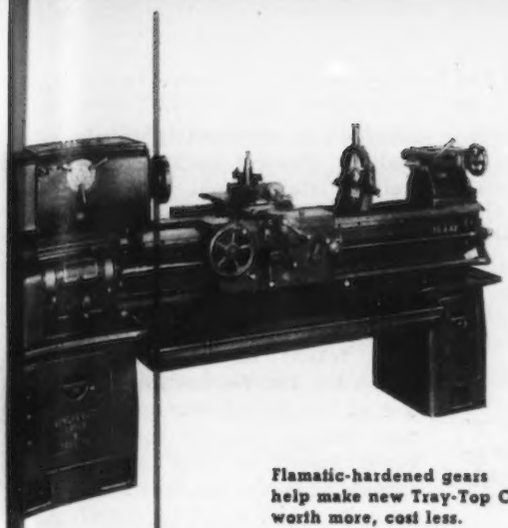
• Truman Report ducks primary issue . . . Conservative only in light of past performances.

WASHINGTON—Reassuring, moderate, temperate, conservative. These are the adjectives that are being widely used to characterize President Truman's midyear Economic Report to the Congress. And if viewed in the light of his past economic pronouncements, notably the Economic Report submitted in January of this year, these descriptive terms have been properly used.

The President belatedly admitted that inflationary pressures have evaporated, and taking note of the adjustment underway throughout industry, pointed out that the economy possesses "vitally important elements of strength that did not exist in earlier periods." As if to further reassure business, he dropped his earlier pleas for a general tax increase, mandatory price and allocation controls, and government authority to expand basic industries, notably steel. On this latter point, the President simply recommended that Congress provide for a broad study of potential business investment, expansion, and market opportunities, "designed especially to discover inadequacies in capacity in basic industries which may serve as limiting factors to expansion when the upward movement of business is resumed."

There is little doubt that the Economic Report clearly indicates that the President's more conservative-minded economic advisers, headed by Treasury Secretary Sny-

	TRUMAN REPORT	NATHAN REPORT	ANDERSON REPORT
Taxes	Repeal tax on transportation of goods. Liberalize provisions for carry-over of corporation losses. Raise estate and gift taxes. No major tax increase.	Reduce taxes to stimulate consumer demand. Repeal wartime excises. Raise exemptions and lower rates at lower income levels.	Raise tax exemptions and reduce rates.
Public works	Funds for advance planning and acquiring sites.	Advance planning and immediate projects in areas of unemployment.	Long-range planning and immediate public works and service projects to meet unemployment.
Unemployment compensation	Increase the amount and duration of benefits and extend coverage.	Increase the size, duration and coverage.	Increase duration of covered unemployment and raise benefit rates.
Old-age and survivors	Raise benefits and extend coverage.	Raise benefits and extend coverage.	Increase benefits.
Public assistance program	Extend and improve program.	Enlarge public assistance grants.	Remove eligibility restrictions. Increased funds.
Business investment	Extend time limit on maturity of RFC loans.	Liberalize RFC. Stimulate investment through loans and incentives.	Liberal credit policies.
Farm legislation	Improved program of farm income supports.	Program of income supports rather than price supports.	
Minimum wage	Increase to 75¢ an hr and broaden coverage.	Increase to 75¢, with $1 permissible.	Higher minimum wage standards.
Labor	Strengthen collective bargaining.	Repeal Taft-Hartley Law.	Stimulate and strengthen collective bargaining. More funds for USES.
Veterans	Extend readjustment allowances.		Extend readjustment and education benefits.
Foreign Trade	Extend Reciprocal Trade Act. Provide technical assistance to undeveloped areas and encourage investment in such areas.	Government stimulation of private investment abroad.	



Flamatic-hardened gears help make new Tray-Top Cintilathe worth more, cost less.

gears hardened for better "head work"

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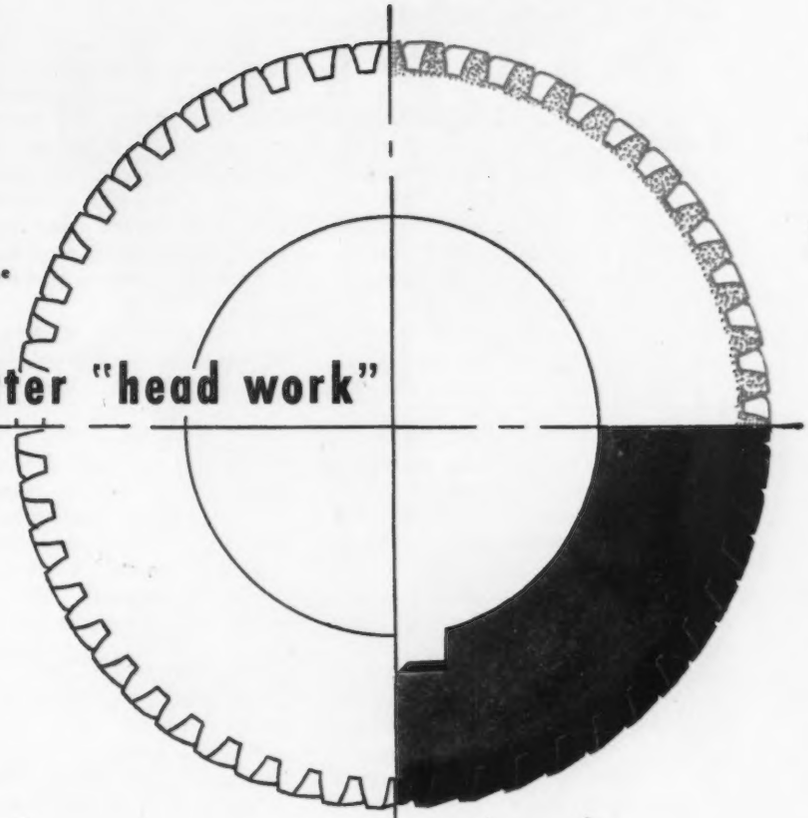
Surface hardness, gradient, and depth held uniformly to predetermined values, as shown by etched section



achieved

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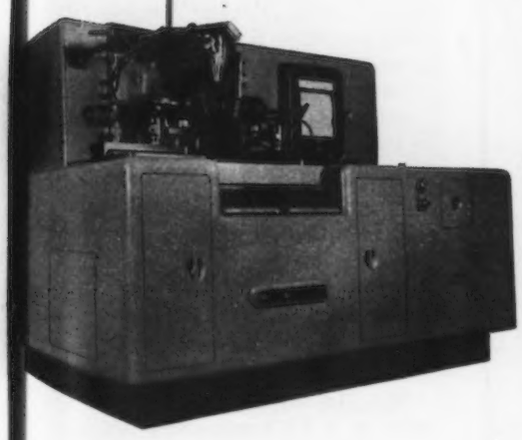

More lathe for less money in every detail was written into the specifications of the Cincinnati Lathe & Tool Co.'s new economy-priced Tray-Top Cintilathe, a requirement that Flamatic-hardened transmission gears helped to achieve. First, the desired hardness patterns in the gears (for headstock, quick change gear box and apron) were literally **blueprinted** and optimum values for surface hardness were established. Flamatic proved that these specs could be held, right on the button, each gear—indeed each tooth—being **uniform** and **uniformly** good. Stock: SAE 3150; surface hardness: RC 52 to 58; production rate on 4" OD, 3¼" face, spindle helical gears: 180/hour.

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der, Commerce Secretary Sawyer, and Chairman of the Economic Council Nourse, are temporarily more influential than the left-wing group headed by left-wing Economic Council member Leon Keyserling.

IT is also true that the President even had a few nice things to say about business. For example, Mr. Truman stated that "the adjustment process has been rendered less difficult by the prudent actions of many groups and individuals in our business system." He also credited "many far-seeing businessmen" with making "sincere efforts to avoid or minimize price increases during inflation," and in recent months with trying to reduce prices and seeking "valiantly to maintain production and employment."

However, despite all this reassuring talk, the President did not meet squarely the one issue which would do more to restore business confidence than any other action that could be taken in Washington—proper handling of the government's fiscal affairs. Paying only lip service to economy in government, Mr. Truman advocated spending of additional billions for social welfare purposes.

Emphasizing that the current $60 billion in public expenditures, federal, state, and local, represents one of the vital props to business activity, he advocates more of the same resulting in deficit financing at a time when the country is still in a highly prosperous condition, a fact which the President himself does not deny. He proposes the spending of additional billions to carry out his 11-point program, not merely to prevent a "depression or hold our ground" but to continuously expand the national output, for which he sets a goal of $300 billion.

This allegedly moderate pump-priming the President justifies on the grounds that there could be no "greater economic folly" than to attempt to balance the budget in a "declining national economy." The question is rightly being asked: "If the budget cannot be balanced and the national debt retired in a period of prosperity, when will it be done?" Certainly, this spending policy lends weight to the arguments of those who would repudiate or stabilize a part of the national debt, regarding it as national asset.

In other words, while dropping the more collectivist portions of his January message, the President advocates a course which could well result in a permanently unbalanced budget, thereby backing into the welfare state about which recent warnings appear to have gone unheeded.

THE Council of Economic Advisers in its accompanying report warns of the uncertainty which has not yet been dispelled as one of the major reasons the business decline has not begun to reverse itself to any appreciable extent. It is obvious that the President is not helping to dispel this uncertainty in the business world by advocating continuing deficits and higher spending. Any reassurance that might have been drawn from the Presidential statement that there should be no general tax rise has been minimized by his advocacy of unsound federal fiscal policies. In this connection, the President justified the spending of additional billions to increase national output by stating that "higher national output means more federal revenues at any given tax rate." True, but when does the country get off this merry-go-round of "something for nothing?"

A further indication that the President has not completely forsaken his more liberal advisers is the striking similarity between the Presidential legislative recommendations and those contained in two recent reports issued by left-wing economists. The first of these is the report entitled "A National Economic Policy for 1949" prepared by Robert R. Nathan for the CIO. The second is a report, much narrower in scope, prepared by Dewey Anderson, former TNEC star performer and an inner circle member of the Keyserling clique.

While these reports are considerably moderate in tone, considering the sources, they nontheless back the Truman spending program to the hilt. The similarity is strikingly illustrated in the accompanying compilation, which lists the major recommendations of each of them.

Mr. Nathan in releasing his report at a CIO-sponsored luncheon claimed that the present business readjustment is not healthy, and while admitting that the country is still relatively prosperous, he demanded the use of public funds, even if it means deficit financing, to raise the economy to even higher levels. The Anderson report echoed the same sentiments.

THE BULL OF THE WOODS — BY J. R. WILLIAMS

NO, TH' BULL JUST SAID HIS CAR WON'T START AN' FOR YOU GUYS TO HURRY--HE'S AT HONK'S BARBER SHOP!
IF I HAD STOCK IN A COMPANY I WOULDN'T WORK IN IT--YOU SEE MUCH TOO MUCH! OLD RANT, THERE, HAS A LITTLE STOCK, AN' HE WON'T SLEEP TONIGHT!
NO, HE'LL BE WONDERIN' IF TH' BIG BOYS PAY FOR ALL THIS PRIVATE STUFF--GAS, OIL AN' TIME! HA-HA! IT'S TOUGH WHEN YOU AIN'T GOT ENOUGH STOCK TO LOOK OVER TH' BOOKS!
GAS
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J.R WILLIAMS
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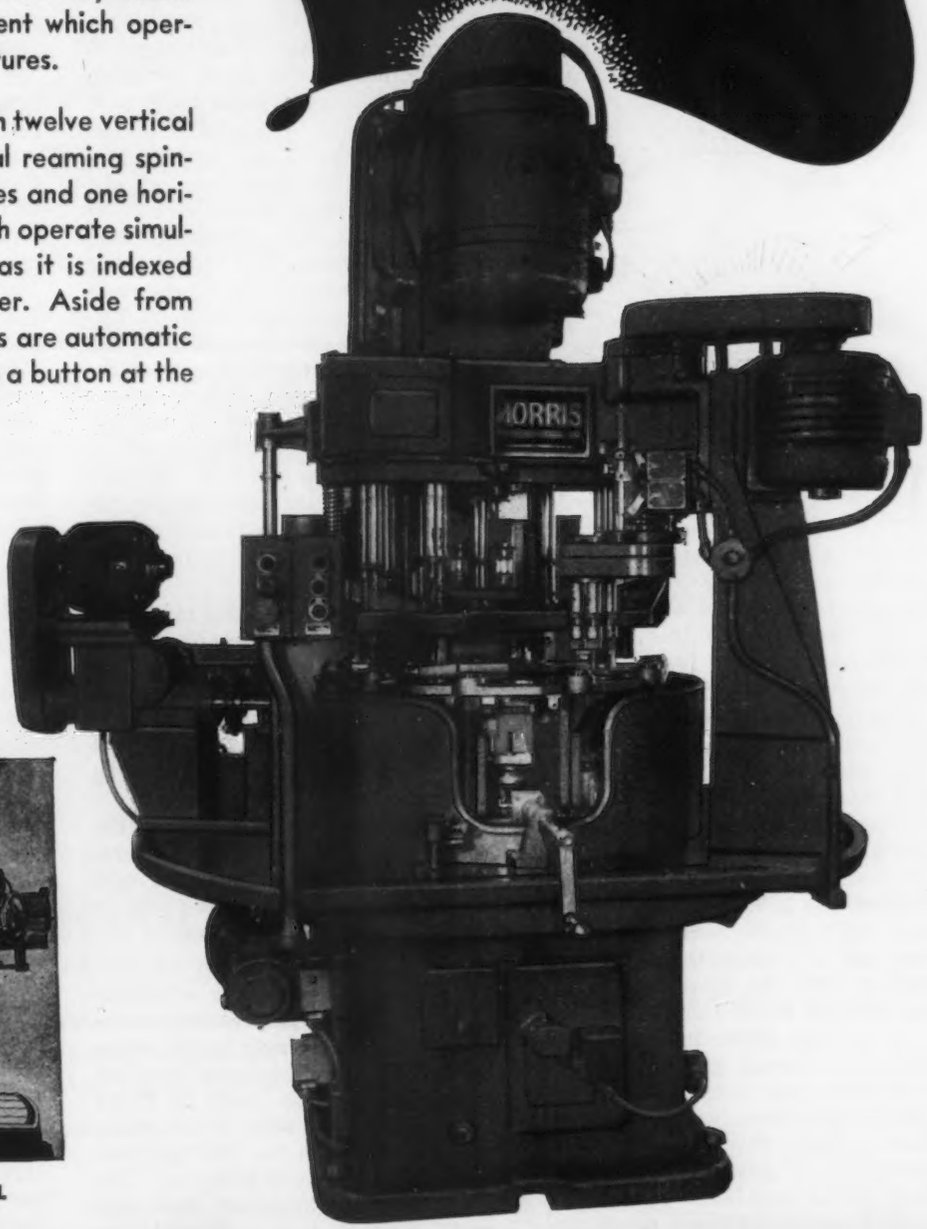

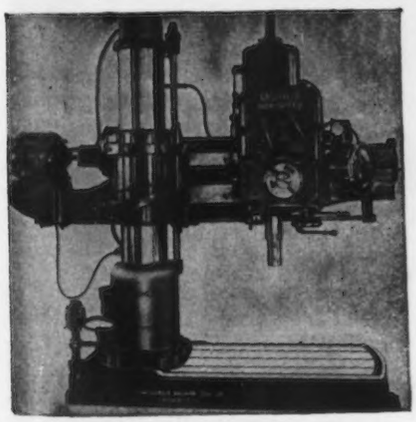

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West Coast . . .

ROBERT T. REINHARDT

• With 15 pct of auto market, the West is producing only about 8 pct of national total . . . Approximately one half million units to be assembled in California this year.

LOS ANGELES—Although the West is generally conceded to constitute approximately 15 pct of the national automobile market, only about 8 pct of all cars manufactured in the U. S. are currently assembled in this area, according to a survey just completed by THE IRON AGE.

During 1948 approximately 375,000 automobiles and light trucks were assembled in the Los Angeles and San Francisco areas of California—the only major automobile production centers on the coast. In the first 6 months of this year approximately 271,000 passenger cars and light trucks were assembled here and it is estimated that by the end of 1949 the total will be approximately 600,000 units.

At present approximately 15,000 men and woment are employed in production and office work in the automotive assembly business in the state. Even though the rate of assembly of passenger cars and light trucks here is not equal to the market demand, present production is considerably in excess of prewar years.

At that time Ford, Studebaker, Chrysler, Buick, Olds, Pontiac and Willys Overland were assembled in California at the rate of approximately 154,000 units per year. Since that time Studebaker and Nash have established assembly plants here and other companies have expanded their facilities. This production increase has had a considerable impact upon parts suppliers in the West with an estimated $200 million being spent for components by these automobile producers.

Principal purchases in this territory are for batteries, wheels, bumpers, springs and some rubber accessories. Although there has been considerable talk in the trade about the possibility of large press-metal parts being produced on a volume basis by one manufacturer for a number of automobile companies, there is nothing at present which indicates realization of this project. It is known that the Pressed Metals Div. of Douglas Aircraft Co. has been carrying on considerable research and study in that direction but thus far no major contracts have been signed.

It will be recalled that this company has made considerable strides in the use of Kirksite dies and has been pressing out fenders for the California Parts & Supply Co. The company has presses of 5000 tons size in its plants at Santa Monica, El Segundo and Long Beach.

Purchasing departments of the various automobile companies repeatedly state that there are still scores of small parts that could be profitably made in this area.

AN inducement to the establishment of large pressing operations in the West may be the availability of cold-rolled sheets from the Columbia Steel Co. plant at Pittsburg and those soon to be made available through the new facilities at Kaiser Co., Inc. at Fontana. The products from these two plants will make available to industrialists for the first time wide sheets suitable for automobile production. However, it is pointed out that the design of modern automobiles is requiring still wider sheets and that western produced material may soon be limited as to its adaptability.

Total productive capacity of all assembly plants in California is approximately 650,000 units per year but even the most optimistic in the industry hesitate to predict a production level of more than 80 pct of capacity during this year.

The only plans for expansions or new assembly plants known in this area are those concerning the Kaiser-Frazer Corp. whose president, Edgar F. Kaiser, recently announced that his company was planning a large number of small assembly plants scattered throughout the United States. Insiders claim to know that this project is based on plans well along in the blueprint stage although the report that 1000 such plants were planned was considerably exaggerated. It is known that the organization has already gone so far as to prepare blueprints and a model of a typical plant adapted to produce 20 cars per day and that sites in Portland and Los Angeles are already being viewed with this project in mind.

The company has had under lease for several years a portion of a Douglas Aircraft plant at Long Beach which has remained idle. It was originally planned to use that plant for assembly of Kaiser and Frazer automobiles but this has been held in abeyance because production at Willow Run was adequate to serve the market. Under this new proposal of 20-car-a-day plants this unit may be put into production although officials of the company are reluctant to indicate any time element.

Of all the small cars announced as going into production on the Coast during the past 3 or 4 years none has entered the market. Several prototypes have been built and embryonic assembly lines constructed but for a variety of reasons these small units have not taken hold. At least two of these entrepreneurs are still struggling to get into the market.

AT present this is the automobile assembly picture on the Coast:

Chrysler Corp., Los Angeles: Produces Plymouth, Chrysler, Dodge

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DISTRIBUTORS: Steel Sales Corp., Detroit, Chicago, St. Louis, Milwaukee, Indianapolis and Minneapolis—Miller Steel Co., Inc., Hillside, N. J.—C. L. Hyland, Dayton, Ohio—Dirks & Company, Portland, Oregon—James J. Shannon, Milton, Mass.—Service Steel Co., Los Angeles, Calif.—American Tubular & Steel Products Co., Pittsburgh, Pa.—Strong, Carlisle & Hammond Co., Cleveland, Ohio—Drummond, McCall & Co., Ltd., Toronto, Canada.

and DeSoto. Production figures were not released by the company but it is estimated that a total of approximately 50,000 units were assembled there in 1948 and that approximately 37,000 units were assembled the first 6 months of 1949. Estimated production for all of 1949 is 65,000 units. There are 1150 hourly employees and 150 salaried employees. W. H. Curtis is operating manager.

Chrysler Corp., San Leandro: Produces the Dodge passenger cars and trucks, and Plymouth. This unit began operating in May of 1948 producing Dodge only and assembly of Plymouth was started there this spring. Actual production figures have not been made available but it is known that the plant is operating at the rate of approximately 230 passenger cars and 50 trucks per day and it is estimated that total production for 1949 will approximate 70,000 units. There are 1236 employees. J. P. Mansfield is plant superintendent.

Ford Motor Co., Long Beach: Both trucks and passenger cars are assembled here and in 1948, 27,600 passenger cars and 13,100 trucks were turned out. The first 6 months of 1949 saw 19,600 passenger cars and 3500 trucks produced. Effects of the recent shutdown because of eastern strikes have now been dissipated and the plant is producing at the rate of approximately 248 units daily with a production force of 1000 workers and 250 salaried employees. Aubrey L. Edwards is plant manager.

Ford Motor Co., Richmond, Calif.: In 1948 there was 36,946 passenger cars and 14,291 trucks assembled here. For the first 6 months of 1949, 21,723 passenger cars and 5427 trucks were assembled with 1315 production workers and 288 salaried employees. W. A. Abbott is plant manager.

Ford Motor Co., Los Angeles: The Lincoln and Mercury are assembled in this plant which opened in 1948. Production in that year was 2900 Lincolns and 17,400 Mercurys and it is estimated that a total of 40,000 Mercurys and 5800 Lincolns will be assembled here this year with 1000 employees including 800 production men. The plant is turning out approximately 130 units per day with a maximum capacity of 200 units. Edward J. Bond is plant manager.

GENERAL Motors Corp., Southgate, Calif: The Buick, Pontiac and Oldsmobile are assembled here. Total production of all units in 1948 was 69,658 and for the first 6 months of this year 48,217. There are 2050 production employees and 250 salaried employees. Henry Clark is plant manager.

General Motors Corp., Chevrolet Div.: No breakdown of production at Van Nuys, Calif. and Oakland, Calif. Chevrolet and Fisher body plants are available but it is estimated that 1948 production at the Van Nuys plant which was just completed in that year produced approximately 25,000 units and the Oakland plant 91,000 units. It is estimated that for the first 6 months of this year the Van Nuys plant produced 20,000 units and the Oakland plant 64,000 units. These are not official estimates and were made on the basis of information developed by THE IRON AGE. There are 1100 production employees and 200 salaried employees at the Van Nuys Chevrolet plant where L. C. Fitzgerald is plant manager and A. T. Clausen is resident manager for Fisher body. There are 2700 production workers and 500 salaried employees at the Oakland plant. Dale Douglas is Oakland plant manager for Chevrolet and Charles Metcalf, is resident manager at Oakland for Fisher body.

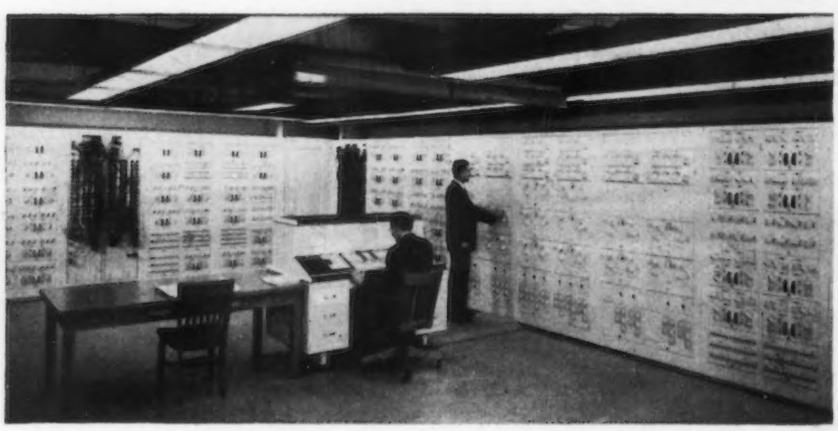
Total official production figures for all General Motors units in the West including Buick, Pontiac, Oldsmobile, Chevrolet and GMC trucks for 1948 are 186,541 units and for the first 6 months of 1949, 132,268 units.

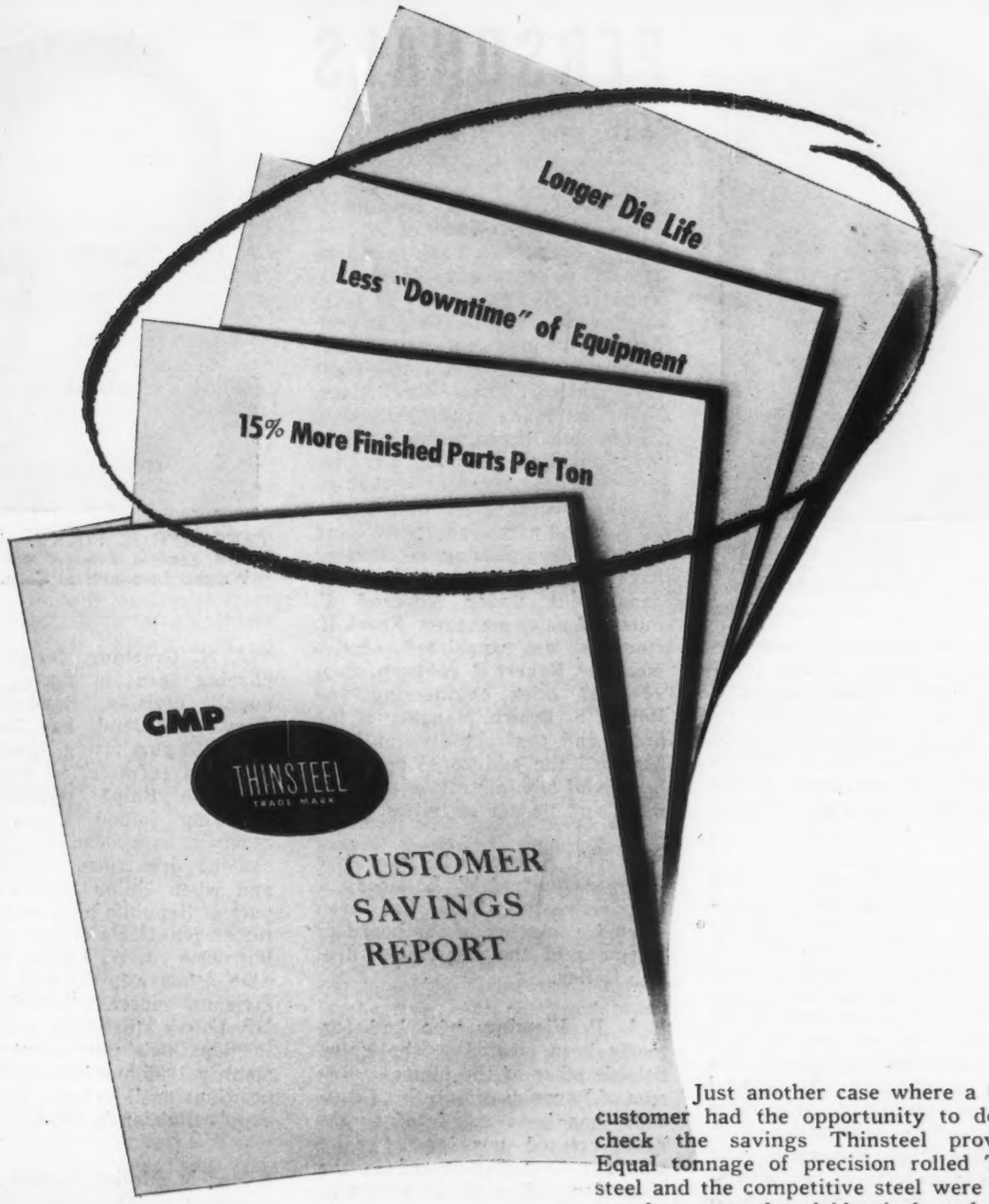
Nash Div., Nash-Kelvinator Corp., El Segundo, Calif.: This plant opened in October, 1948 with a production of about 80 cars per day and this figure has now been increased to more than 90 units per day on a one shift operation. It is estimated that approximately 11,000 units were produced in the first 6 months of 1949 and that total production for the year will exceed 23,000 cars. There are 500 production employees and 100 salaried employees and Campbell Woods is works manager.

Studebaker Pacific Corp., Vernon, Calif.: In 1948 this plant produced 22,400 units and it is estimated that this year production will be increased to a total of 33,000 units. An increase in rate of production has been achieved by re-designing overhead conveyors which increased the rate of assembly from 58 per day at the start of last year to 96 in the middle of last year and to 136 units per day by February of 1949. There are 735 hourly workers and 150 salaried employees. It is interesting to note that this company's freight bill for last year amounted to $5 million. E. M. Douglas is vice-president in charge of production.

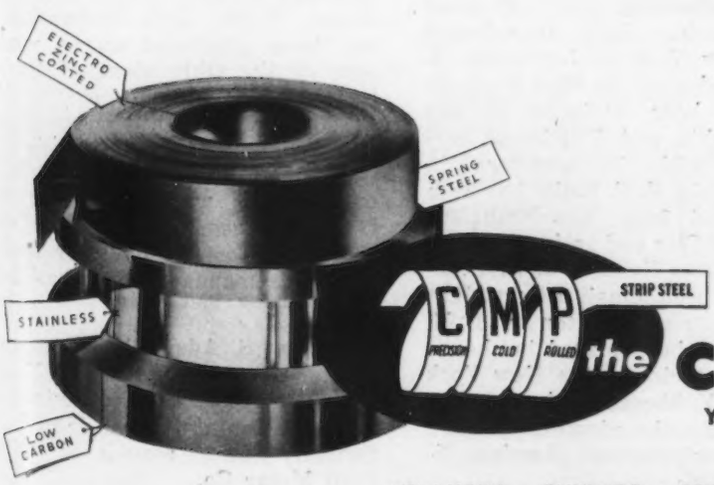
Willys-Overland Motors, Maywood, Calif.: In 1948 this company produced 3399 units and it is estimated production this year will reach 6296 cars. There are 225 hourly employees and 75 salaried employees. James J. Welker is plant manager.

GENIUS AT WORK: *Latest and largest ac calculating board built by Westinghouse was installed recently for Pacific Gas & Electric Co. Problems of operating extensive high-voltage transmission lines between the company's many hydroelectric generating stations were such that help was needed in making the many calculations involved in load divisions, relaying, stability, and the like.*





Just another case where a CMP customer had the opportunity to double check the savings Thinsteel provides. Equal tonnage of precision rolled Thinsteel and the competitive steel were compared on normal and identical production runs . . . the cost saving facts are headlined above. It's typical of Thinsteel customers' reports in our file. So when you are planning product improvement and want to keep costs competitively right it would be worth checking Thinsteel availabilities. Your inquiry will bring interested attention from this pioneer in precision cold rolling.



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PERSONALS

ROBERT L. EARLE, senior vice-president in charge of aeronautical operations, Curtiss-Wright Corp.

• **Herbert B. Jeffrey** has been promoted to assistant to the president and **Ross Wilkins,** assistant vice-president, becomes also assistant general manager of sales, Great Lakes Steel Corp., Detroit. Mr. Jeffrey had previously served as executive department chief coordinator.

• **G. R. Jones** has been appointed general sales manager of Oldsmobile Div., of the General Motors Corp., Detroit. He has been associated with the division in various sales posts on the Pacific coast since 1933. Mr. Jones succeeds **D. E. Ralston** who has recently been named executive assistant to the general manager. **A. H. Brandel** has been appointed production manager of the Oldsmobile Div., succeeding **P. J. Monaghan,** who has a new assignment in the sales department. Mr. Brandel has been assistant production manager for the past 4 years, and has been with the division more than 40 years. **J. J. Edwards,** general methods engineer, has been promoted to general supervisor of standards and methods. He joined GM in 1940 and was transferred to the Oldsmobile Div. in 1941.

• **Ross G. Allen** has been appointed secretary and treasurer of Southern States Iron Roofing Co., Savannah. He had been secretary and assistant treasurer. In his new position, Mr. Allen takes over the duties of treasurer, which have been performed by J. W. McIntire, executive vice-president.

• **Robert L. Earle** has been elected senior vice-president of Curtiss-Wright Corp., New York, in charge of its aeronautical operations. **Theodore B. Focke,** general manager of the Airplane Div., has been named vice-president and general manager and a director of Wright Aeronautical Corp., Wood-Ridge, N. J., the engine-building division. **H. Fletcher Brown,** former factory manager of the Airplane Div., becomes general manager of that division succeeding Mr. Focke. The service and parts departments and the field engineering department have been merged into the sales department under **Edmund C. Sulzman,** sales manager. **Frank H. Hankins** was appointed service manager, **Robert E. Johnson,** manager of sales engineering and **Robert K. Brown,** manager of the order and contract division, was assigned the additional responsibilities of administration of spare parts and license activities.

• **A. V. Stjepcevich,** executive vice-president of W. L. Moody & Co., Galveston, Tex., has been elected a member of the board of directors of the Lone Star Steel Co., Dallas.

• **A. P. Fleming,** who had formerly been located at the Philadelphia office of the pigment division of Reynolds Metals Co., Louisville, has been appointed to the newly-created position of sales manager and transferred to the New York office of the company. **F. W. Allsmiller,** assistant sales manager, has been transferred from New York to Louisville. **J. W. Macauley** of the New York office has been assigned to the Philadelphia and Pittsburgh territories, with headquarters in Philadelphia. **E. F. Reilly** has been transferred from San Francisco to Kansas City and assigned to the central states division. **A. H. Kleinfeldt** has been appointed assistant to the technical director and **L. H. Besten** has been placed in charge of sales service in the New York office. **L. V. Sheain** has been transferred from the pigment division to the newly-formed chemical division.

THEODORE B. FOCKE, vice-president, general manager and director, Wright Aeronautical Corp.

• **J. H. Graebing,** formerly purchasing agent in charge of mill supply division, Republic Steel Corp., Cleveland, has been promoted to purchasing agent for alloys and refractories, succeeding the late **Ralph Bowman.** Mr. Graebing joined Union Drawn Steel Co. as a member of the purchasing department in Massillon and when Union Drawn became part of Republic he transferred to the corporation's central purchasing office. **J. W. Lowry,** who has been a buyer in the mill supplies division, succeeds Mr. Graebing. Mr. Lowry started as a file clerk in Republic's purchasing department in 1935 and has held various positions until he came to the mill supply division in 1944.

• **Max M. Muller,** former general manager of the Swiss Grinding Wheel Works, Ltd., Switzerland, has been appointed works manager of the Ohio plant of Basic Refractories, Inc. succeeding **N. E. Hanson,** recently appointed works manager of the western division. **A. M. Weaning,** who has been acting works manager in Ohio, has been promoted to assistant to **Tom W. Ryan,** recently named as manager of operations.

• **Thomas S. Adams** has been appointed manager of the new Nash Div., of the Nash-Kelvinator Corp., at Toronto. Mr. Adams had formerly been associated with Ford Motor Co.

• **Leonard F. Crowley** has been named a vice-president of Earle M. Jorgensen Co. with operations in Los Angeles, Oakland and Houston.

• **Carl C. Wood** has been appointed plant manager of Chevrolet Motors, Grey Iron Div., Saginaw, succeeding **James F. Miller,** retired. Mr. Wood was named chief inspector of the Grey Iron Div. of Saginaw Products in 1926 and was later promoted to general superintendent.

• **Frederick P. Bernhard** will retire Aug. 1 as comptroller of the International Nickel Co. of Canada, Ltd. and International Nickel Co., Inc., New York. Mr. Bernhard has been with the company for 50 years. He will also retire from his positions as a director and comptroller of Whitehead Metal Products Co., Inc., New York, subsidiary of INCO.

• **Martin P. Teller** has been appointed vice-president in charge of engineering of Gimpel Machine Works, Philadelphia. Mr. Teller was valve engineer for many years of the valve division of Schutte & Koerting Co., Philadelphia.

• **John J. Radigan** has been named director of industrial relations of E. W. Bliss Co., Detroit. Mr. Radigan has been associated with Bliss since 1946 and was previously assistant director of personnel of all plants.

• **N. Loyall McLaren,** senior partner in the firm of McLaren, Goode & Co., San Francisco, has been elected a director of the Atchison, Topeka & Santa Fe Ry. Co.

• **Fred. W. Okie** has been elected president of the Bessemer & Lake Erie R. R. Co., filling the vacancy created by the death of **Frank I. Snyder** on June 18. Mr. Okie also serves as president of the Union R. R. Co.

• C. **J. Beneke** has been named product manager for the wire, rod, bar, structurals and cable division of Reynolds Metals Co. in Louisville. Mr. Beneke joined Reynolds in 1940 and set up the company's Plant 7 merchant mill and its structural mill.

HARRIE S. TAYLOR (left), president, and E. W. SLOAN, JR. (right), vice-president and treasurer, Oglebay, Norton & Co.

• **Harrie S. Taylor,** formerly vice-president in charge of mining operations, has been named president and a member of the board of directors of Oglebay, Norton & Co., Cleveland, succeeding **Crispin Oglebay** who has become chairman of the board. **Robert C. Norton,** formerly vice-president and treasurer, has become vice-chairman of the board. **Henry P. Rankin,** formerly president of Di-Noc Mfg. Co., has been appointed to the board of directors. **Courtney Burton** has been named vice-president; **E. W. Sloan, Jr.,** former assistant to the general manager, has become a vice-president and treasurer, and **Fred R. White, Jr.** has become a vice-president. **Gordon C. Nichols,** former assistant general counsel, has become secretary. **R. H. Weir** has resigned as assistant secretary of the company and will remain as a special consultant.

• **James T. Buckley** has been elected chairman of the board of directors of Philco Corp., Philadelphia, succeeding the late **John Ballantyne.** Mr. Buckley was president from 1939 to 1943 and has since served as chairman of the executive committee. He joined the company in 1912 and has spent his entire business career with the company.

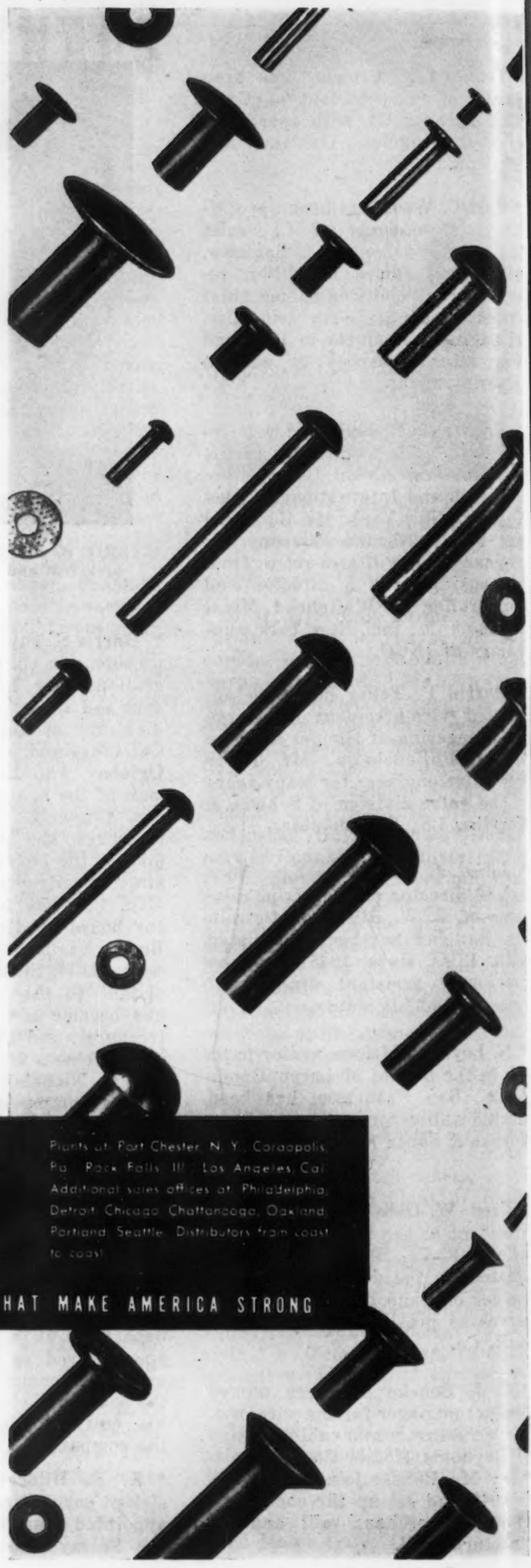
• **K. E. Hildreth,** formerly assistant purchasing agent, has been appointed purchasing agent for the Solvay Process Div., Allied Chemical & Dye Corp., New York, succeeding **E. Austin Barnes** who has retired after 59 years with the Solvay organization.

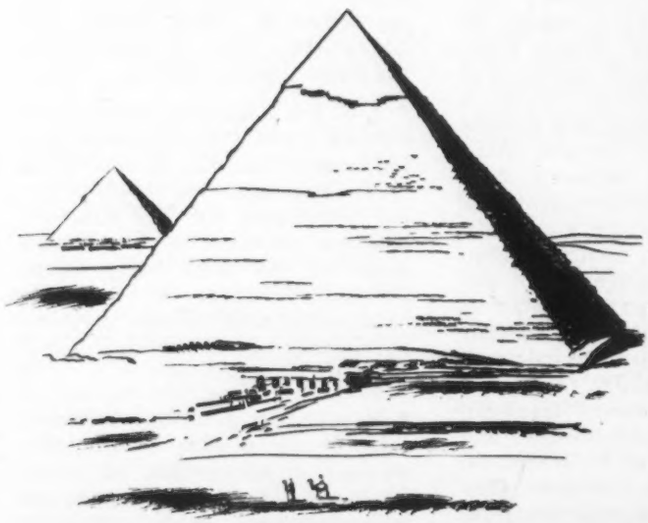
• **J. G. Kreis** has been named purchasing agent of the Taylor-Wharton Iron & Steel Co., High Bridge, N. J. The duties of this position are performed by Mr. Kreis in addition to those of purchasing agent of the Weir Kilby Corp., Cincinnati, where he has his headquarters. Mr. Kreis has been purchasing agent for Weir Kilby since 1918.

• **Harold L. Gruehn,** formerly sales representative in the Milwaukee district office of Allis-Chalmers, has been appointed midwest region dealer supervisor, with headquarters in Chicago. Mr. Gruehn has been associated with Allis-Chalmers since 1941 and since 1945 has been specializing in paper mill industry and franchise products in the Milwaukee district sales office.

• **Sands G. Falk** has been named manager of foundry sales of the Falk Corp., Milwaukee, succeeding **John S. Wilkinson** who will become foundry sales consultant on Oct. 1 for 3 months, after which he will retire. Mr. Falk has been associated with the company for 10 years and has been assistant manager for the past 5 years. Mr. Wilkinson joined the company in 1905 and has been active in foundry sales more than 20 years.

RIVETS THAT CAN BE UNIFORMLY DRIVEN will maintain permanence of the assembly... help you get *True Fastener Economy*. The extra margin of long-lasting holding power furnished by RB&W **SMALL RIVETS** is the product of more than a century of continuous research and progressive development in rivet manufacturing . . . backed by the skill of four generations of RB&W men and women.





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• B. **E. Harris,** has been elected a vice-president of Ford, Bacon & Davis, New York. Mr. Harris has been with the firm since 1923, having had charge of many large projects in the fields of design, construction, valuations and reports.

• **John K. McDonough** has been appointed director of sales of the Colonial Radio Corp., Buffalo. **C. K. Bagg** has been appointed sales manager and **Bernard O. Holsinger** has been named advertising and promotion manager.

• **E. A. Bonneville,** sales manager of the Barcalo Mfg. Co., Buffalo, has been elected vice-president in charge of sales. Before joining the company, Mr. Bonneville had been manager of unit air conditioner sales for the Fedders-Quigan Corp.

• **Marshall P. Ralls** has been appointed assistant sales manager of Pressure Castings, Inc., Cleveland. He had formerly served as purchasing agent. He joined the company in 1941.

• **Robert F. Hodgson** has been named chief engineer, Hydraulic Equipment Co., Cleveland. He has been with the company for 4 years, serving in the engineering and sales departments.

• **R. L. Brown** has been appointed division engineer in charge of engineering and development of instrument transformers, tap changers and large power centers for the transformer division in Sharon, Pa., Westinghouse Electric Corp., Pittsburgh. He succeeds **J. H. Chiles, Jr.,** who has been made engineering manager for the entire transformer division.

• **Jonathan Jackson,** formerly advertising manager of the Sisalkraft Co., Chicago, has been transferred to the company's New York office in an executive capacity. **Thomas E. Kearney,** formerly assistant advertising manager, has been appointed advertising and sales promotion manager.

• **Ken Jackson** has been appointed sales representative for the State of Pennsylvania for Camcar Products Co., Rockford, Ill. He had previously represented American Screw Co. for a period of 16 years.

THOMAS W. SIMMONS, JR., vice-president and general manager, Johnston Pump Co.

• **Thomas W. Simmons, Jr.** has been elected vice-president and general manager of the Johnston Pump Co., Los Angeles. Mr. Simmons was president of the Johnston Aquamatic Co., York, Pa. **Kenneth G. Lundie** has been appointed general sales manager. He was formerly western sales manager of the Pomona Pump Co., Pomona, Calif., and was in charge of sales for the C. J. Hammer Co., Visalia, Calif.

• **R. G. Caulley** has been appointed vice-president in charge of sales of Peninsular Grinding Wheel Co., Detroit. Formerly general sales manager, Mr. Caulley has held executive positions with Republic Steel Corp. and Fruehauf Trailer Co.

• **Paul N. Sutton** has been appointed sales training manager of Willys-Overland Motors, Toledo. Mr. Sutton joined Willys after conducting the first postwar sales training program at Reo Motors, Inc.

• **A. J. Frieling,** for the past 15 years a representative of various firms in the industrial sales field in the Michigan-Ohio area, has joined the Stewart-Warner Corp., Chicago, as a field sales representative for the South Wind division, to procure contracts for parts, fabrication and light assembly services.

GEORGE H. WILLITS, director of patent section, General Motors Corp.

• **George H. Willits** has been named director of the patent section of General Motors Corp., Detroit, succeeding **Louis M. Spencer,** who has retired. Mr. Willits has been assistant director of the patent section since 1946. He has been with GM since 1923.

• **James H. Carmine,** vice-president, distribution, for the past two years, has been elected executive vice-president of Philco Corp., Philadelphia. Mr. Carmine has been with Philco since 1923 when he joined the company as district sales representative in Pittsburgh.

• **E. H. Remde,** formerly works manager has been appointed to the newly-created post of adviser to the president on engineering and manufacturing, Industrial Truck division of the Baker-Raulang Co., Cleveland. **H. A. Schultz,** formerly superintendent, has been made manufacturing engineer, and **I. L. Young** has been appointed general superintendent. **John A. Matousek** has been appointed manager of manufacturing, in charge of all manufacturing, purchasing and engineering functions.

• **Emil Buban** has been appointed factory superintendent of Detroit Harvester Co., Detroit. Mr. Buban has been with the company 10 years and had recently been general foreman.

CLYDE C. RANDOLPH, acting works manager, Point Breeze Works, and works manager, Tonawanda and Allentown plants, Western Electric Co.

• **Clyde C. Randolph** has been appointed acting works manager of Western Electric Co.'s Point Breeze Works, Baltimore, and works manager of Tonawanda plant, Buffalo, and Allentown plant, Allentown, Pa. Mr. Randolph, who has been manager of the Radio Shops in Winston-Salem, N. C., succeeds **Arthur B. Goetze** who was transferred to the Chesapeake & Potomac Telephone Co., where he has been elected vice-president in charge of personnel. **F. E. Henderson,** former superintendent of the Cable Shops, Point Breeze, was named manager of the Radio Shops, succeeding Mr. Randolph.

• **E. J. Bjorenson** has been appointed direct factory representative for the southeastern states for the E. F. Griffiths Co., Philadelphia. Mr. Bjorenson has completed intensive factory training.

• **William R. Wiley** has been appointed sales engineer for McCullough Tool Co., Los Angeles. Mr. Wiley was formerly with Emsco Derrick & Equipment Co., Los Angeles.

• **William B. Tanner** has been named director of advertising of the Electrical Reactance Corp., Franklinville, N. Y. Mr. Tanner has been associated with Buffalo advertising agencies for 20 years.

• **Sanford H. Bennett** has been appointed manager of the Buffalo plant of the American Magnesium Corp., Pittsburgh, succeeding **Joseph N. Moorhead,** who has retired. Mr. Bennett had been chief engineer of the Cleveland plant of the parent Aluminum Co. of America, before his assignment to the Buffalo post.

• **Albert D. Becker** has been appointed representative for the eastern section of New York, Berkshire County in Mass., and Vermont, with headquarters in Albany, for L. J. Wing Mfg. Co., New York. **Fred McMeans** has been appointed representative for the Province of British Columbia, Canada, with headquarters in Vancouver.

• **W. O. English** has been made sales manager of the Lakeview Forge Co., Erie, Pa. Mr. English has been associated with the National Lock Washer Co., Newark, N. J. for the past 15 years and has been manager of the Drop Forging division, which has recently been purchased by Lakeview, for the past several years.

• **Stanley C. Lore** has been made general manager, J. B. Kendall, Inc., Norfolk, Va., succeeding Mason B. Peebles, who died. Mr. Lore has been associated with Carnegie-Illinois Steel Corp. for 14 years, for the past 9 years in the sales department covering the Richmond and Norfolk territory.

WILLIAM L. MOSHER, JR., plant manager, Kansas City Div., Chevrolet Motors.

• **William L. Mosher, Jr.** has been appointed plant manager of Chevrolet Motors, Kansas City division. Mr. Mosher joined Chevrolet in 1927 as an assembly line worker. In January 1949 he was appointed general superintendent of production.

• **C. T. Posey** has been appointed field engineer in the midwestern area for Arcos Corp., Philadelphia, with his headquarters in Chicago. Mr. Posey has been associated with the Arcos Corp. since 1946 as field engineer.

OBITUARY...

• **Paul B. Steward,** 54, president and general manager, Chase Steel & Supply Co., died recently.

• **Edward E. Long,** 57, secretary and assistant treasurer, Alan Wood Steel Co., Conshohocken, Pa., died July 7.

• **Hayward Niedringhaus,** 58, president and general manager, Granite City Steel Co., Granite City, Ill., died July 7.

• **Charles Hosmer Morse III,** 51, vice-president in charge of manufacturing, Fairbanks, Morse & Co., Chicago, died July 9.

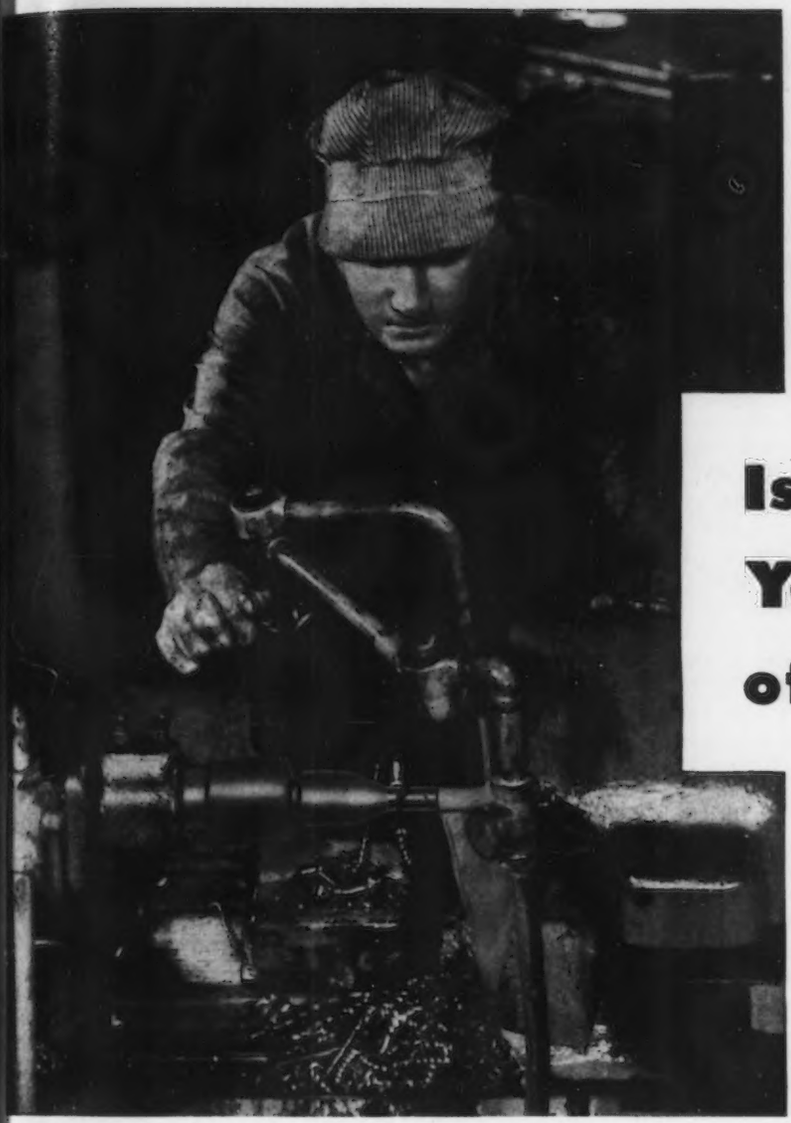
• **Orrin H. Baker,** 64, sales manager of the railroad materials and commercial forgings division of Carnegie-Illinois Steel Corp., Pittsburgh, died July 13.

• **Samuel Alsop,** 55, president of Alsop Engineering Corp., Milldale, Conn., died July 7.

• **Robert L. Stephenson,** 72, former vice-president, Decatur Iron & Steel Co., Decatur, Ala., died July 2.

• **Marcus Boyd,** 66, president, Boiler Tube Co. of America, McKees Rocks, Pa., died July 5.

• **Arthur Dockter,** general superintendent, De Laval Steam Turbine Co., Trenton, N. J., died recently.



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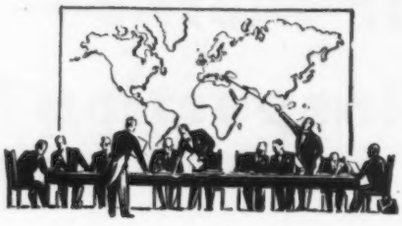
European Letter . . .

• Titoism an international phenomenon . . . Financial effort possibly worthwhile to bolster Yugoslavs resisting Cominform boycott and strengthen organization of Greek government personnel . . .



LONDON — During the year which has followed the famous resolution of the Cominform expelling Yugoslavia from its membership, Titoism has become an international phenomenon. With the single exception of Czechoslovakia, all the east European communist parties have undergone purges of nationalists. Their first victim was the Rumanian Patrashcanu, whose disgrace actually preceded that of Tito. Later in 1948 came the turn of the Pole, Gomulka, and the Albanian, Koci Xoxe, of whom the first has so far escaped lightly with the loss of his important state and party functions, while the second was executed only recently. In 1949 Bolshevik vigilance has unmasked the Bulgarian vice-premier Kostov, the Greek rebel leader Markos Vafiades and the former Minister of the Interior in Hungary, Rajk. The last-named has been accused of espionage on behalf of the imperialists, and thousands of spontaneous telegrams have already poured in from the toiling masses demanding a rope for the traitor.

Each case has brought further confirmation of the fact that Titoism consists not in any mistake of social or economic policy, or party tactics, but in insufficient adulation of the majestic figure of Stalin, "leader of the world proletariat," and of those men whom, in his infinite wisdom, he has appointed to give instructions to the young and inexperienced communist parties of the liberated countries. The crime of Kostov, as described in an article in the organ of the Cominform by a former secretary of the Comintern, the Bulgarian Vasil Kolarov, was that he failed to realize that secrets and commercialism do not figure in Soviet-Bulgarian relations. Kostov systematically withheld from Soviet trade representatives the price at which Bulgaria sells certain goods to capitalist states. The great George Dimitrov himself declared Kostov guilty of the shameful assumption that the Soviet Union might injure the state interests of Bulgaria. Thus, any communist who considers his country an independent state when dealing with a representative of the USSR is guilty of the impious offense of nationalism. The most eminent criminals have been publicly denounced, and in each party the lesser offenders are being sought out and rendered harmless.

THE purge is unlikely to stop there. The history of Soviet communism shows that the suppression of one deviation is usually followed by the unmasking of its opposite. When the Trotskyists had been liquidated, it was the turn of the Bukharinites. The Soviet press today denounces with equal rage the twin opposite sins of nationalism and cosmopolitanism. Both heresies are, it maintains, weapons of American imperialism for undermining the true faith.

Reprinted from the London Economist by special permission.—Ed.

The grotesque aspects of this purge should not be allowed to obscure the fact that it has attained its main object—to clamp down the Russian vice still tighter on eastern Europe. Just as the wartime phrase "governments friendly to the Soviet Union," accepted at its face value by President Roosevelt, proved in practi to mean quisling regimes of Sovi puppets, so the slogans "socialis comradeship" and "proletarian i ternationalism" are a rhetoric camouflage for total obedience the Politburo of the Soviet co munist party. The Politburo re ognizes only two categories human being, whether within beyond the frontiers of the Sovi Union—enemies and slaves. present in eastern Europe the fir category outnumbers the secon The purge has consolidated t second category; for its increa the Moscow planners rely on ti and their well-tried methods education. When, for a wh generation, all children have be removed from the influence either priests or liberal teache a substantial army of enthusiast slaves should be available to the master's work.

MEANWHILE, as a result the spring cleaning of 19 the east European communi parties will be more perfect i struments. Some discontent a bewilderment will have be caused within their ranks, but is unimportant. There is plen of hatred of communism and Russia in eastern Europe, but is unorganized and powerles Communist party members ha to fear the wrath of their hie archial superiors in Moscow a the wrath of the noncommuni masses of their own peoples. T double fear will keep them to t party line. Perhaps a more se ous loss to Moscow will be di may among communists beyo the Lübeck-Durazzo line. Wi the examples of Kostov, Gomul and Rajk before them, can wes ern communists maintain th communism would bring the countries freedom, independen and prosperity? Would it ev bring them, personally, the offi and the influence of which th dream? But this is, general speaking, only a reaction of i tellectuals. The hard core French and Italian labor will main loyal to the party as long prices are high, food is scarce a unemployment threatens. And

(CONTINUED ON PAGE 144)

FORGING POWER

for mass production of MASSIVE FORGINGS

AJAX FORGING MACHINES, built on the basis of mechanical soundness, deliver at high production speed the tremendous power for heavy forging with accurate alignment and minimum of deflection.

These great, rigid, powerful machines, with air clutch that provides instantaneous response to the operation of the treadle, put the production of massive forgings of complex form on the mass production basis. And the quality of the forgings, both from the standpoint of greater strength and greater uniformity, is maintained to a uniform high standard.

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Write for Bulletin 65-C.

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DEWART BUILDING NEW LONDON, CONN.

• **STEEL PRODUCTION**—Despite the cutbacks in the steel operating rate this year, the nation's mills produced 45,928,476 net tons of raw steel by the end of June according to the American Iron & Steel Institute. The new top exceeded all previous records by 406,049 tons which was made in the second half of 1948. Steelmaking furnace operations averaged 82.2 pct of capacity during June, against 94 pct a year before. The greatest drop in the rate of operations of installed capacity was recorded by the electric furnaces, for a percentage figure of 41.1 pct. Open-hearth furnace operation was at an estimated 85.2 pct of total capacity.

• **BUSY DAY**—The British Ministry of Supply has lost no time in implementing its newly announced policy of establishing parity with U. S. metal prices. On July 12 copper prices were cut in order not to handicap exporters by charging more than the world price. The same day news was received of a further 5/8¢ per lb increase in the U. S. price. So the Minister promptly raised United Kingdom prices the same amount. The new price was effective July 13.

• **FOREIGN TRADE DOWN**—Although declining from April levels, domestic exports in May were just holding their own with the 1948 monthly average. Imports were 10 pct below last year's average. Iron and steel products were down slightly from April exports but still considerably above the 1948 average. Industrial machinery showed the greatest drop but exports likewise were ahead of last year and were four times the 1939 dollar volume.

• **WATCHFUL**—Canadian supply and demand in iron and steel markets have reached balance in most products. While there has been some slowing down in new orders recently, this has had little or no effect on domestic output. Canadian steel men are closely watching developments on the steel-labor front in the U. S.

• **YOU'RE FADED**—Republic Steel Corp. has followed Armco's July 1 cut in extras on polishing stainless steel sheets. Republic's action was effective July 12. The average reduction of sheet polishing extras is 30 pct. It was previously met by Allegheny Ludlum on July 7 and Carnegie-Illinois on July 11.

• **FREE MARKET**—Price controls on iron and steel scrap exported from Bizone Germany were removed effective July 13. Current contracts will not be affected except insofar as they may provide for renegotiation of price. This action was made possible by means of a recently concluded agreement between the United States and the United Kingdom. It authorizes their military governors in Germany to suspend from time to time the provision in the US-UK ferrous scrap agreement of Sept. 30, 1948 "that the price of scrap shall be uniform to all buyers."

• **ALTERS EXTRAS**—Carnegie-Illinois Steel Co. has revised extras on carbon bars and semifinished products, and most alloy products. The non-standard chemistry extra on carbon bars was dropped. Chemistries in the May American Iron & Steel Institute carbon bar manual have been broadened in some standard grades. The price card has now been modified to fit the new rules. Only about 5 pct of total carbon tonnage is affected. The average price of such items is cut from $1.00 to $2.00 a ton by the new pricing system.

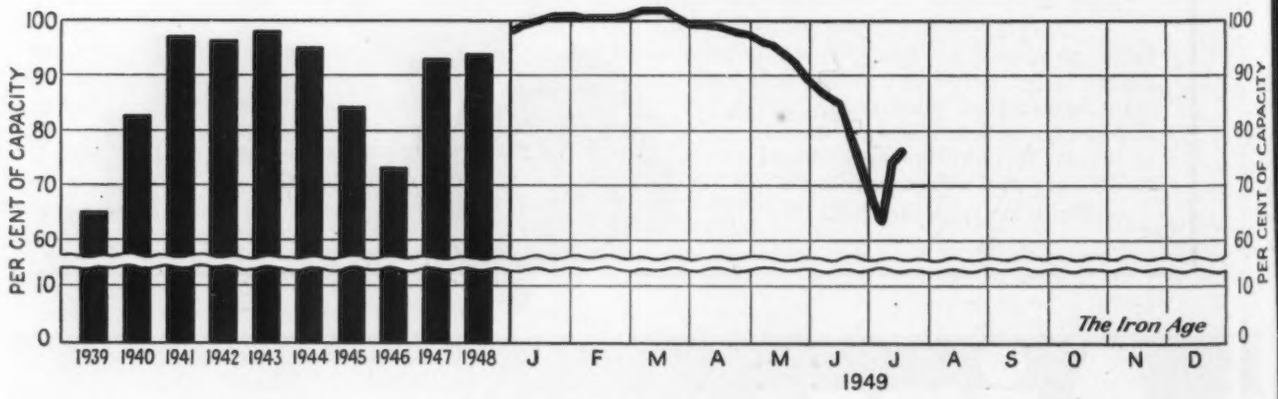
• **EARNINGS OFF**—National Steel Corp. earnings in the second quarter will be off 25 pct from the first quarter, according to E. E. Weir, chairman. Earnings will be at a declining rate over the balance of the year, he said. He estimated that steel production would sink to about 65 pct of capacity in the last quarter of this year.

• **FACT FINDING BOARD**—The President's fact-finding board in the steel dispute has decided to hold its first public hearing on July 28 in New York. The board said it would hold a closed meeting with management and labor officials on July 26 for the purpose of discussing procedure during the public hearings.

• **FREIGHT CARS**—Domestic freight car deliveries during June totaled 9121, according to the American Railway Car Institute. The backlog of orders as of July 1 was 42,813, of which 22,279 belonged to carbuilders and 20,534 to railroad shops. Orders during June totaled 153, all to the carbuilders.

• **MILL SHIPMENTS**—Steel products shipped to warehouses in April totaled approximately 833,000 net tons. This is a decline of 101,000 tons from the March total of 934,000 tons.

Steel Ingot Production by Districts and Per Cent of Capacity



Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
July 12	70.0*	90.5*	59.0*	78.5*	76.0	82.5	88.0	92.0*	88.0*	80.0	63.0	75.5	35.0	75.0*
July 19	75.0	86.5	59.0	82.5	87.0	92.0	89.5	103.0	94.0	80.5	66.5	87.0	15.0	70.5

* Revised.

Industrial News Summary

- **Labor Truce Will Aid Steel Sales**
- **Some Users Will Step Up Fall Orders**
- **Steel Order Cancellations At New Low**

THE steel labor truce will not send steel sales zooming skyward but it should mean a temporary pickup in the industry. Some buyers will begin watching low inventories more carefully to keep from being caught short in case of a deadlock this September. And some orders that were to be placed this fall will be entered now. A few other buyers had already built up excess stocks, giving an added push to steelmaking operations during the past few weeks.

Among some buyers who didn't worry about steel supply in case of a strike there is a new note of caution this week. The thing nearly came off, and now it appears to have been too close for comfort. Many of these firms will now begin to keep their inventories in balance. Some may build up stocks a little now that they know steel isn't kidding about its stand on wages, pensions and an expensive insurance package.

The biggest demand for steel to counter last week's strike threat came from the automobile industry. This week no major automobile producer has less than 30 days' steel on hand and some items reportedly will last 90 days. In cases where additional steel was not bought by the motor car makers many of their orders were stepped up so that entire July commitments were shipped out of the mills before the middle of the month.

The net effect of these two trends is expected to balance out to no mad rush to buy steel during the next month or so, but to produce a little more buying than might normally have been expected. Last week steel sales offices booked very few orders. Some reported less than a tenth of the previous week's bookings, due apparently to the strike threat.

ANOTHER factor beginning to guide purchasing agents in their steel buying is the possibility that the President's fact-finding board may rule in favor of the union. If the steel companies then agreed to some concession it would boost steelmaking costs. It would mean that there is no use waiting for lower steel prices.

But this looks too simple. What probably will happen between now and September is that: (1) Steel users will stop paring their inventories to the bone; (2) they will study incoming cancellations before cutting off the orders they now have on steel mill books; and (3) they will be a bit more liberal in what they order from day to day.

If there is a peaceful settlement on steel labor in September, the period following may see a sharp drop in steel orders and production —and maybe a crack in prices. Major producers of carbon steel have not changed their minds about holding the price line at the moment. A price cut would leave the union cold and might have very little effect on the fact-finding board.

The volume of cancellations received by major steel companies reached a new low for the year during the past week. Steel people think that this is because all the water has been taken out of their backlogs. There is little left on the books to cancel; most business is current, and they hope, good. Warehouses generally have balanced their inventories and brought them to a point they consider adequate under current conditions. Their business is off sharply from what it was in the fourth quarter of 1948 and in some cases they are absorbing freight to meet competition on "country" business.

AS expected, steel companies were able to come back fast this week following small cutbacks made to prepare for a strike. Beginning Wednesday of last week most mills began banking blast furnaces and preparing to clear steel from openhearths. On Friday afternoon they had to reverse the whole procedure. This week the industry set up to operate at 78.5 pct of rated capacity. This is half a point above the figure at which steel companies planned to operate last week. They made only 75 pct of capacity because of the loss caused by taking off units to prevent damage in case the strike had started on Friday at midnight.

The report that one of the big and well managed steel companies would show about 25 pct less profit for the second quarter than it made during the first quarter of this year was a surprise to many. It is not at all clear that the industry will follow this pattern. However, some of the smaller specialty steel firms are expected to present a gloomy earnings picture for the period because their shipments fell faster and further than those of the carbon steel producers.

During the second quarter steel companies with big plants at some distance from their normal markets also began to feel the effects of declining orders sooner than the industry as a whole. And the conversion deal, a very lucrative item for big companies and small alike, also bowed out during the second quarter.

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J&L OTISCOLOY can be worked by any standard metal-working method . . . formed hot or cold . . . welded . . . flame-cut. Its ability to hold paint and resist corrosion further widens its applications.

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Strip-Sheet Sales Department
Jones & Laughlin Steel Corporation
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Pittsburgh 19, Pa.

Please send me at once a copy of your booklet: "OTISCOLOY High-Tensile Steel."

NAME_____

COMPANY_____

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Truman Proposal Reduces Chance of Crippling Steel Strike

New York

• • • **The Truman truce** has done more than postpone a crippling steel strike, it has reduced the odds on one. At the same time it tosses the question of steel prices into a no-man's land 60 days long and a mile wide.

On economic grounds, on the industry's ability to pay, the steelworkers union is likely to be in a far less attractive bargaining position in September than it was last week. And last week its bargaining position was worse than it had been at any time since the war. The industry was running at 78 pct of rated capacity and the trend was down.

This is the gamble Philip Murray had to take when he went along with President Truman's telegram asking for a 60-day extension of current contracts while the case was submitted to a 3-man board empowered to make recommendations within 45 days. The President's proposal, made on Tuesday, July 12, was originally rejected by most steel firms on the grounds that it bypassed the Taft-Hartley machinery. But by Friday it appeared that the union would strike the country's top producers. Bethlehem reluctantly accepted the board plan then, followed by Republic and U. S. Steel, staving off the walkout scheduled for 12:01 a.m. July 16.

Many steel people—even some in U. S. Steel—wondered why acceptance was so slow and reluctant. "With things the way they are we can't afford much higher costs and now's the time to have it out," they reasoned. Economically, the cards were stacked in steel's favor.

But the President had behind him the prestige of his office. To the man on the street the offer to submit the dispute to a fact-finding board looked like a fair deal for both sides. How many could remember back to 1945 when a similar board had held that an 18½¢ per hr wage boost could be granted without affecting steel profits? And how many recalled that the OPA then found the recommendation to be poppycock and had, with Mr. Truman's approval, agreed to boost steel price ceilings by about $5 a ton?

Union's Position May Be Worse In September; Steel Price Problem is Posed

o o o

If the big steel companies had thought they'd get a fair deal from such a board they might have gone along at the start. From past experience the steelworkers felt they had little to lose on the deal. Washington sources say that some weeks ago Messrs. Truman and Murray had an understanding on it. Phil Murray's CIO did a lot for Mr. Truman last November. It was entitled to something in return. And if that return could avoid use of the labor law that candidate Truman had promised to junk—so much the better.

The President laid down a full house and picked up the pot. Steel, critically sensitive to public opinion, folded. But the game isn't over. The chips are still down and steel is unfortunately picking up better cards every minute. Unfortunately, because steel operations are drifting down every week. The President may yet have to use his wild card, the injunction, but the odds are against it.

Another point—one that may be dug up next time the steel industry is accused of acting collusively—the steel companies moved independently in this crisis. Only one major steel producer accepted

Confused?

the President's original telegram in toto after the need for qualification was made clear by the union. That was Jones & Laughlin, fourth largest in the nation. Its head, Admiral Ben Moreell, acted swiftly and independently. He said he'd go along. A dozen others followed, until by Friday at 11 a.m.—just 13 hours before the strike deadline—some 12 steelmakers had agreed to the Truman truce. These, with companies that were not organized by the CIO or that had more distant deadlines, accounted for 27.5 pct of the nation's ingot capacity.

Few of the men in the ranks wanted a strike and Phil Murray knew it. But labor's front was never broken. Still there might have been a nasty strike had not Bethlehem wired its acceptance to the President. Along with U. S. Steel and Republic, these top three of the industry make 57 pct of America's steel, employ 58 pct of its steelworkers. Whether Bethlehem's wire—about noon—followed by Republic's did it or whether U. S. Steel had already made up its corporate mind isn't known. U. S. Steel filed at about 2 p.m., with just hours to spare.

For Republic, its president, Charles M. White, cracked out three pungent paragraphs. Benjamin F. Fairless' wire for U. S. Steel was brief, too. Arthur B. Homer sent a long and sharply worded wire for Bethlehem. Like other steel executives who reluctantly accepted the postponement, all three asserted that the question of another wage increase should not be determined by the recommendations of such a board.

Nobody—but nobody—agreed to be bound by any recommendations the fact-finding board might come up with.

Right now it looks as though the mere public airing of the controversy might do what similar Roman holidays have done before. For the sake of public opinion, based on the frenzy the steelworkers will raise during the next few months, U. S. Steel may give something. That may be more than it offered this time. But unless something unpredictable happens in the business world they'll be less able to give then than they are now. Pensions are out—except as a subject for further investigation. Wages are almost certainly out. Insurance, etc., may wind up with more than the 2½¢ per hr offered, perhaps on a contributory basis.

Meanwhile the steel price enigma will plague everyone. Because operations are still at a fair level for the price leaders (the bigger firms), that subject has not been troublesome. Until now, in the very unlikely case of any steelmaker thinking of a price cut he could well afford to wait until steel labor costs were certainly set even though coal might remain an unknown. Now, as sales continue to fall it may be another matter.

The investigating board named by the President consists of Carroll R. Daugherty, Professor of Business Economics, Northwestern University; Samuel I. Rosenman, former New York State Supreme Court justice; and David L. Cole, a Paterson, N. J., attorney and labor relations consultant.

ATOMIC ACCURACY: *Machining a 13-ft diam forging to an accuracy of 0.0015 in. on major dimensions and to a parallel tolerance of 0.0025 in. in the Wheeling, W. Va., shops of Continental Foundry & Machine Co. Note the minute steps on the face of the forging measuring only 0.017 in. deep. Accurate dimensions and contour are claimed necessary to control the shape of the magnetic field in the cyclotron and to properly direct the paths of the atomic projectiles used in atom smashing.*

Explains Problems Of Selling Through ECA

Washington

• • • **In an effort** to clear up some of the problems of selling through the ECA, the Economic Cooperation Administration has compiled a free book, available for the asking, entitled "Information for American Businessmen on the Marshall Plan."

Emphasizing that ECA does not engage in any actual buying-selling operations, one portion outlines ECA procedure in providing dollar credits and another section lists the active foreign purchasing missions.

Cladmetals Revises Prices

Carnegie, Pa.

• • • **A new price list,** which now includes the new high temperature grades of Rosslyn Metal has been issued by American Cladmetals Co. Reductions reflecting improved manufacturing practices have been made in base prices of some grades of Rosslyn Metal which have copper sandwiched between layers of stainless steel.

Extras have been revised downward for all grades. Prices range from 73¢ to $1.15 per lb. Rosslyn Metal is rolled in sheets up to No. 4 finish in lengths to 120 in. and in widths up to 48 in. Thickness range is from 0.15 to 0.25 in.

Nathan Report on Steel Is Called "Fantastic" in the Industry

Sets Breakeven Point at About 33 Pct of Capacity Under June '49 Conditions

o o o

By GEORGE F. SULLIVAN
Markets Editor

o o o

New York

• • • **If Robert R. Nathan** can show any steel company how to break even at 33 pct of capacity he is wasting his time in Washington. He belongs in Bethlehem, Pittsburgh, Cleveland or points West where he could write his own salary check in seven figures. If he could guarantee the 80 pct of capacity operations he mentions for the balance of this year the industry would be both surprised and pleased.

Steel people don't take the data in the latest Nathan report seriously but they are a bit worried lest someone else do so. The reasons they've called it "fantastic" appear on p. 1 of "Economic Position of the Steel Industry, 1949," a survey prepared for the United Steelworkers of America by Robert R. Nathan Associates.

There on the first page of the report is the statement that "under June 1949 price and cost conditions, the breakeven point is at roughly one third of capacity operations." If Mr. Nathan had said two thirds of capacity it might have been hard to disprove him.

No one in the steel industry knows his breakeven point until operations drop to it. Because that point was reached in some prewar years it is known that it was then about 48 pct for the industry. Wall St. analysts, seeking this figure in the past year, and hoping it would be low—to attract investors—have never come up with anything definite, though a figure near 70 pct of capacity has been mentioned. Still a guess, but if they could have made an honest guess in the neighborhood of 35 pct it would have made them very happy. It would have permitted steel companies to borrow by floating stock; it would have disproved the old "prince or pauper" theory. That never happened.

What Mr. Nathan has overlooked in his discussion of breakeven points is that every time steel sales fall off badly enough someone starts cutting prices. His assumption is based on June 1949 conditions. He's correct when he says steel leaders have given no indication that they are about to cut prices. But they never do. It just happens. A major producer decides to get a bigger share of what little business there is; his competitors follow. Where they go depends on how hungry they are for business or how careless they are about costs.

When operations are low and prices apparently settled down the breakeven point can be figured. It will be different for each company and it will depend on product mix at that time—what proportion of the shipments are tinplate, sheets, rails, structural shapes. The profit margin on each is different in any single company. It also varies by company and by plant location.

A potent factor affecting the point where profits vanish is location. Studies based on what happened in 1938 are useless today because freight rates are now 60 pct higher than they were then. If mills can absorb freight to hold up their operations that will be one thing. How much they'll have to absorb is another. None of these factors is known now and since they are likely to be different when the time comes they can't be calculated now.

The man doesn't live who can write an equation in 18 unknowns and solve it—even on informed guesses—to within 10 pct accuracy. These unknowns, in summary, include: labor cost, labor productivity, ore cost, fuel oil cost, scrap prices and a host of other raw material items, to say nothing of plant location and product mix.

When all this is done there is still the No. 1 unknown—business. Mr. Nathan calculates that "under June 1949 conditions and only 80 pct of capacity production, the industry could pay 10¢ more per hour to its employees and earn the same

MURRAY SPEAKS: *Last week before the steel truce, Philip Murray (center), president of the United Steelworkers of America, CIO told a news conference that he would call a strike effective at midnight Friday (July 15), against all steel firms declining to go along with President Truman's delay-strike proposal.*

Industrial Briefs . . .

• DOCTOR FAIRLESS—Benjamin F. Fairless, president of U. S. Steel Corp., Pittsburgh, will be given an honorary degree of Doctor of Science in Business Administration by Bryant College, Providence, on Aug. 5. Mr. Fairless has also been chosen as the outstanding and most inspiring industrial leader to address the graduates.

• MAY BUY—Reynolds Metals Co., Richmond, Va., has entered into an agreement with Southern States Iron Roofing Co., Savannah, to increase the distribution and sales of Reynolds aluminum building products in the South. As part of the agreement, Reynolds has taken a 6-month option to purchase 51 pct of the common stock of Southern States.

• JACKPOT—Weirton Steel Co. has announced that nearly $3.5 million was distributed to 12,000 employees on June-end payday—biggest in its 40-year history. Vacation allowances of more than $2 million coupled with regular pay set the record.

• TOURING EUROPE — Albert Kellner, director of export sales for Pemco Corp., Baltimore, porcelain enamel finishes manufacturer, has departed on an extensive tour of customers' and prospective customers' plants in European countries.

• MORE RANGES — Perfection Stove Co., Cleveland, has acquired the patents, trade names and the exclusive right to manufacture and market the Acorn and Oriole range lines manufactured by Standard Gas Equipment Corp., Baltimore, along with certain other physical assets of the Baltimore company.

• MOTION PIX—A new 16mm sound motion picture, "Production Miracles Through Controlled-Air-Power," has been released by the Bellows Co., Akron. The film is a case history showing the use of controlled-air-power in effecting cost reductions in various manufacturing processes.

• NEW HOME—A new building is being erected at 1544-58 South State St. to house the Chicago branch of Fairbanks, Morse & Co.

• COME TO THE FAIR — The Houston Construction Industries Exposition, presented by the Houston chapter of Associated General Contractors, will hold its second annual exhibition at the Sam Houston Coliseum, Sept. 25 to Oct. 2.

• WHITNEY WINS — The first annual award of the Concrete Reinforcing Steel Institute and $500 cash will be presented to Charles S. Whitney, representing the firm of Ammann & Whitney, New York, for their paper, "Thin Shell Concrete Structures."

• ADDS SHAPERS — Hamilton-Thomas Corp., Hamilton, Ohio, has announced the acquisition of the Smith & Mills Co., Cincinnati, manufacturers of crank shapers. The company will be known as the Smith & Mills Div. and will operate at the Hamilton plant of the parent company.

• NEW MONIKER—The Schauer Mfg. Corp., Cincinnati, is the new name of the Schauer Machine Co. which manufactures a complete line of speed lathes for finishing operations, bench grinders and battery chargers.

• WANT TO LEARN? — Cornell, Western Reserve, Dartmouth and Purdue Universities are conducting special summer conferences in sales engineering designed particularly for the machine tool industry. The conferences, run in cooperation with the National Machine Tool Builders' Assn. and the American Machine Tool Distributors' Assn., are open to employees of members of these associations.

• PARTS DEPOT — International Harvester Co. has announced completion of contract-letting for construction of a wholesale parts depot, costing approximately $1 million, in South Memphis. It is expected to be ready by next spring.

high level of profits as in 1948 when profits were 12.1 pct of investment." He adds that a 5 pct reduction in material costs would justify even larger wage increases.

Steel profits in 1948 were good, though apparently not good enough to make steel shares an attractive investment compared with other major industry groups which earned far more on their investment. And conceivably, material costs could come down though they'd not likely stay there in the face of a general fourth round wage increase or its equivalent. The interesting figure in Mr. Nathan's assumption is the "80 pct of capacity." What happens to the possibility of paying an additional 10¢ per hr if the steel operating rate falls to 70 pct?

Is 70 pct unlikely this year? Cleveland was within 6 points of it last week and Youngstown was 5½ points lower. Some mills have been lucky to hit 60, and a few have been running lower, depending on costs, price, products and location.

June 1949 conditions, the basis of much of the study, have already gone into limbo. It is just possible that a smart swami, gazing into his crystal ball might come up with a new set of prices, markets and operating rates for next October. If so he has a job in the steel industry—but not at Mr. Nathan's theoretical salary.

Union Officials File More Non-Communist Affidavits

Washington

• • • **Ten per cent** more non-Communist affidavits by union officials were on file with the National Labor Relations Board at the close of the fiscal year than a year ago, board records reveal.

As of July 1, 1949, a total of 86,100 were on file as compared with 77,905 a year previous. A total of 186 nationals and internationals are now in full compliance as well as 9073 locals.

Buys Government Pipeline

Washington

• • • **War Assets** has approved the sale of the southern portion of the Southwest Emergency Pipeline to the Southwestern Independent Gas Pipeline Co. of Houston for $279,000 cash.

Truman Says Wartime Mining Losses Were Legitimate Risks

Washington

• • • **President Truman** has vetoed a bill which would have bailed out wartime mining losses by operators who were attempting to fulfill both formal and implied contracts.

This is not interpreted to mean that a bill to provide subsidies for peacetime development and marginal operations would necessarily be turned down. Such bills are now pending.

But in respect to the vetoed bill, HR 834, Mr. Truman held to the view that the wartime losses were incurred as legitimate business risks "within the framework of our free enterprise system." He added that risks were less than normal because of the backing and aid of the government through RFC loans, Defense Plant Corp., the Bureau of Mines, and subsidies by the Metals Reserve Co.

"If, however, the operation was unsuccessful, either because costs were higher than expected or because expectations as to the supply of ore were not realized, it was assumed that he (the operator) would bear the loss," the White House message said.

Evansville Plant to Build Station Wagon Bodies

Evansville, Ind.

• • • **Dodge,** DeSoto and Chrysler station wagon bodies will be built at Chrysler's Evansville plant in addition to Plymouth passenger cars. The Evansville plant now assembles Plymouth passenger cars and builds chassis and body wire harness systems for all Plymouth cars.

The new station wagon body work will occupy 200,000 of the plant's 500,000 sq ft, according to Chrysler officials.

Currently, the Evansville plant is building 475 Plymouth cars per day and 3000 wire harness systems. In addition, 25 Dodge, DeSoto and Chrysler station wagon bodies are built.

Current employment at the Chrysler Evansville plant is 1600 which is approximately double the 1941 employment figure.

To make its station wagon bodies impervious to moisture Chrysler gives all wood parts, including joints and inaccessible surfaces, two coats of varnish before assembly. A final coat of varnish is added after the parts are put together.

Praises ECA's Work

Pittsburgh

• • • **Economic** Cooperation Administration is doing a good job in Europe, Chester H. Lehman, executive vice-president of the Blaw-Knox Co., said on his return from a 6-weeks' tour of European subsidiaries, affiliates and agencies.

Mr. Lehman said foreign business men feel that the Marshall Plan has halted the spread of communism on the continent. He expressed belief that a better understanding of ECA's contributions to world stabilization will lead American business men to closer cooperation in its program, both here and abroad.

Grants Wage Increase

Minneapolis

• • • **Minneapolis Moline Co.** granted a wage increase of 5¢ an hr, in addition to other benefits, which are equivalent to about 3¢ an hr more. The company, which manufactures farm machinery, reached that agreement with the CIO-United Electrical Works which covers more than 4000 employees in the firm's three plants and general offices. The wage increase is retroactive to July 1.

RFC Approves Loan For Expanding Lone Star Steel Facilities

Washington

• • • **Reconstruction Finance** Corp. last week approved a $34 million loan for expansion of Lone Star Steel Co. facilities. RFC officials said it was the largest business loan granted by the billion-dollar lending agency since World War II.

Lone Star originally asked RFC for $74 million for plant expansion. The agency denied the loan on the ground that it could not authorize such a sum without proof of collateral or equity financing by the borrower. (THE IRON AGE, July 7, P. 135.)

Later, the Texas firm pared down its proposed expansion program to $56 million and asked RFC for $34 million, stating at the same time that it was prepared to supply $28 million in collateral and working capital.

RFC said the loan is to be used for purchase and installation of finishing facilities for manufacture of electric weld steel line pipe and oil well casing.

Harley Hise, RFC chairman said conditions of the loan require Lone Star to invest $22 million in expanding facilities prior to disbursement of the RFC loan and in addition to provide working capital of not less than $4 million.

Lone Star is now manufacturing coke, pig iron, and coke oven by-products. Its present plant, together with the new facilities, will be pledged as collateral to the RFC loan.

Coming Events

Sept. 12-16	**Instrument Society of America,** conference and exhibit, St. Louis.
Sept. 14-16	**Porcelain Enamel Institute,** annual forum, Columbus, Ohio.
Sept. 25-Oct. 1	**American Institute of Mining & Metallurgical Engineers,** midyear meeting, Columbus, Ohio.
Sept. 26-28	**National Electronics Conference,** Chicago.
Oct. 3- 5	**American Coke & Coal Chemicals Institute,** annual meeting, Skytop, Pa.
Oct. 4- 6	**Industrial Packaging & Materials Handling Exposition,** annual convention, Detroit.
Oct. 10-14	**American Society for Testing Materials,** West Coast meeting, San Francisco.
Oct. 12-15	**Electrochemical Society,** semiannual meeting, Chicago.
Oct. 13-15	**Foundry Equipment Manufacturers Assn.,** annual meeting, White Sulphur Springs, W. Va.
Oct. 17-21	**National Metal Congress,** Cleveland.
Oct. 24-26	**American Gear Manufacturers Assn.,** annual meeting, Chicago.

Weather and Boat Capacity Now Play Second Fiddle to Demand in Ore Movement

o o o

By BILL LLOYD
Cleveland Regional Editor

o o o

Cleveland

• • • **Weather and boat** capacity, a couple of perennial problems in the Great Lakes iron ore movement since 1941, were fading into the background this week as the steel industry battled a sharp drop in demand which will affect its iron ore tonnage requirements in 60 days.

Less than four months ago, movement of more than 85 million tons of Lake Superior district iron ore to lower lake ports, topping the 1948 peacetime high of 83 million tons, was freely predicted by qualified sources in the iron ore trade here.

But this week, pessimistic sources, with the 40 pct drop in merchant iron demand in mind, were talking about a 20 pct cut in the iron ore movement, which would mean about 70 million tons for the 1949 season.

Despite statement that storage facilities for an 85 million ton movement would have proved inadequate, as of July 11, according to Lake Superior Iron Ore Assn. figures, the season's movement was obviously in the magnitude of 85 million tons.

On July 11, the Great Lakes fleet had moved 2,491,697 gross tons more iron ore than on the corresponding date in 1948. This includes Canadian ports.

To July 1, the season's movement was 33,185,570 gross tons. Adding to this total the tonnage moved from July 1, 1948 to the close of navigation, the 1949 season movement would be more than 85 million gross tons.

On the other hand, it is already known that there will be a slow-up in the movement. Cancellations, for example, are reported to total more than 2 million gross tons at the present time.

But the prewar custom was to lop off the movement during the last weeks of navigable weather when consumers had their estimated requirements. This could be the case this year, weather to the contrary.

In the meantime, the fleet will probably continue to move at the present pace as long as necessary. How long this may be, however, is highly problematical. Most vessel operators were planning to move as much as possible in the hope that a strike would not materialize. Ore carriers would be tied up loaded.

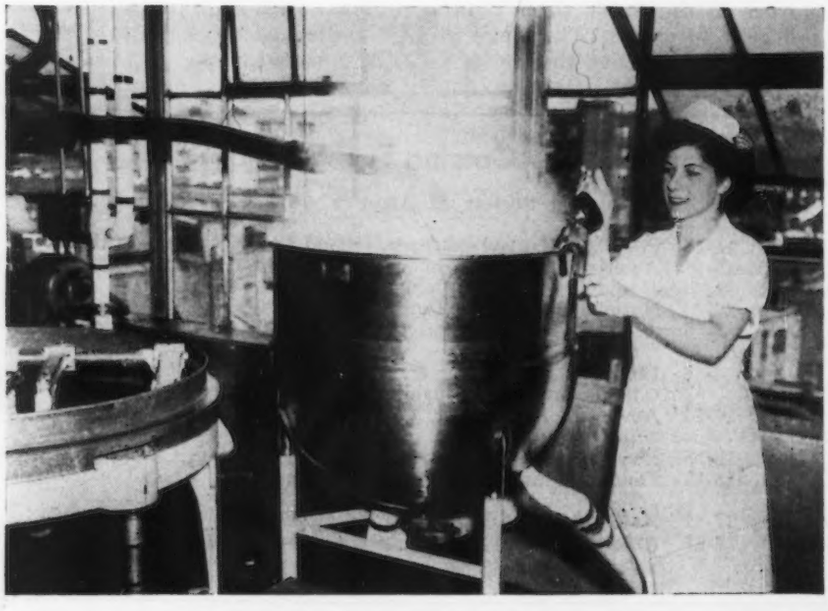
A factor in the progress of the iron ore movement to date has been the small coal movement. Boats have been going up the lake light and turn-around time has been reduced by half or more.

Some observers, refusing to become party to the growing gloom over steel demand insist that the 1949 season's movement will be somewhere between 77 million and 80 million gross tons. They arrive at this figure by taking from the 1948 movement tonnage moved during November and December, (also the most logical months to halt navigation) and adding the total from July 1 to Nov. 1, 1948 to the July 1, 1949 total, resulting in an estimate generally considered rather optimistic in view of the steel industry's labor problems for the next 60 days.

But apart from labor problems, hint of what could happen to the Great Lakes iron ore movement this year is evident in the current report of the Lake Superior Iron Ore Assn. which shows that on May 1 10 U. S. furnaces were idle. On June 1, 21 U. S. furnaces were idle. Many of these were merchant stacks, out of blast, not for repairs but lack of demand.

If the present downward trend in steel demand continues through the late summer and fall, there is little doubt in the iron ore trade that the 1948 movement will make the high point of the postwar hysteria in steel.

CLAD COOKER: *This, the first steam-jacketed kettle made of Rosslyn Metal, is reported to cook as fast as a copper kettle at 85 psi at temperatures up to 260°F. It is installed in the Barricini candy plant, Long Island City, N. Y. Rosslyn Metal, a stainless-copper-stainless "sandwich", made by American Cladmetals Co., is said to last longer than copper and is easier to clean.*



Buick Production Up 48 Pct

Flint

• • • **Buick has increased** its production 48 pct during 1949.

For the first 6 months of this year the company has produced more than 200,000 cars. During 1948 the 200,000 mark was not reached until Sept. 24.

Last month Dynaflow was installed on 73 pct of Buick's total car production. During the first 6 months of this year 147,705 Dynaflow transmissions have been built and installed.

Hoover Report Spurs Formation of Single Procurement Agency

Consolidated Purchasing and Inventory of Supplies Are Foremost Functions

o o o

By GEORGE BAKER
Washington Bureau

o o o

Washington

• • • **In a year** during which Congress has voted millions for foreign aid, domestic subsidies, and across-the-board increases for almost every kind of service provided by the national government, the recent creation of a new federal agency passed almost unnoticed.

The new agency is GSA—General Services Administration. It is headed by Jess Larson, one-time War Assets Administrator whose name became well-known to the steel industry last year when he refereed the Henry Kaiser-Charles White fight over disposal of WAA's mammoth Stack No. 5 at Cleveland.

Creation of the new agency is, in a way, in line with one of the efficiency recommendations made earlier this year by the Hoover Commission on Reorganization of the Federal Government.

Briefly, GSA represents a wedding of four previously independent agencies—Bureau of Federal Supply, Federal Works Agency, National Archives, and War Assets. It also is now one of the largest bureaus—aside from those of cabinet rank—in the sprawling morass of federal organizations. Between 60,000 and 70,000 persons are employed by GSA at present as a result of the merger and more are to be added during coming months.

The principal concern of businessmen with the new agency is, of course, procurement of supplies by Uncle Sam. The new agency will not necessarily do all the buying for the federal government. In fact, the law under which it operates specifically excludes the Army, Navy and Air Force from its provisions. And the Agriculture Dept. is also exempted from bringing its price support buying under the combined program.

What the agency will do is establish uniform policies and methods for procurement and supply. A good part of the actual buying —aside from that carried out by the former BFS—will continue in the hands of the separate agency concerned.

The new law requires, for one thing, constant surveillance by every agency and department of the property under its control. It also sets up a uniform system for the identification and classification of property. It requires standardization of contract forms, of specifications, and of buying procedures. It further requires the departments and agencies to maintain reasonable inventory levels and to establish adequate inventory controls.

The new law also authorizes the Comptroller General to prescribe principles and standards for property accounting based on the needs and requirements of each agency. And the Comptroller General is empowered to audit all types of property accounts and transactions of departments and agencies.

President Truman lost no time in urging Mr. Larson to make the most of his opportunity to bring efficiency into the picture of federal buying policies. In an order issued to Mr. Larson and all other agencies and departments only 24 hr after the GSA Bill became law, Mr. Truman called for the drafting of GSA regulations for government buying and record keeping at the earliest possible date to make such activities efficient and economical.

And each agency, President Truman continued, "shall carefully plan and schedule its requirements for supplies, equipment, materials and all other personal property in order that necessary stocks may be maintained at minimum levels and high cost small-lot purchasing avoided.

Earlier this year, the Hoover Commission criticized unplanned federal buying, pointing out that about half of several million purchase orders issued annually are for amounts of $10 or less and about 87 pct are for $1000 or less, and that since the cost of processing a purchase transaction is greatly in excess of $10, the overhead cost is more than the cost of the goods. Broader authority to negotiate contracts for amounts up to $1000 will also cut down some of the overhead connected with a strict system of competitive bids.

From an organizational point of view, GSA represents a consolidation of all functions of the FWA, including the Public Buildings Administration, Bureau of Community Facilities, and the Public Roads Administration; the Bu-

(CONTINUED ON PAGE 143)

PRESSURE VESSEL: *An alloy steel pressure vessel seamless-forged and machined at Bethlehem plant of Bethlehem Steel Co. for a high pressure chemical plant installation. It's designed for a pressure of 2840 psi but hydrostatically tested at 4260 psi. The body has an OD of 38 in. and an ID of 32 in. Its total weight is 38,600 lb and overall length 22 ft.*

Proposes Survey For New Aluminum Plant In British Columbia

Montreal

• • • **Aluminum Co.** of Canada, Ltd., proposes to carry out an extensive engineering survey into possibilities of establishing an aluminum plant in British Columbia, a company official here stated. A short time ago officials stated they were giving serious consideration to Tweedsmuir Park in west-central British Columbia as a possible site for the proposed plant. Tweedsmuir Park is located some 400 miles northwest of Vancouver and vast hydroelectric resources are said to be available in the vicinity.

This is the second survey to be made by the company, and a party already has been sent into the interior of the province to establish a camp. Officials stated the proposed survey will cost about $1 million. Officials further pointed out that if establishment of an aluminum refinery were decided on for British Columbia, it would mean further expansion of Canada's aluminum industry would take place on the Pacific coast, rather than at Arvida, P. Q. The limit of available horsepower from the war-built Shipsaw power development at Arvida already has been reached.

AMERICAN IRON AND STEEL INSTITUTE

Production of Open Hearth, Bessemer and Electric Steel Ingots and Steel for Castings

YEAR 1949

(Preliminary)

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production (Net tons)	Number of weeks in month
	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		
January	7,287,683	101.1	408,552	92.6	487,260	93.8	8,183,495	100.2	1,847,290	4.43
February	6,633,779	102.0	379,698	95.3	467,247	99.6	7,480,724	101.4	1,870,181	4.00
March	7,473,901	103.7	430,176	97.5	483,850	93.2	8,387,927	102.7	1,893,437	4.43
1st Quarter	*21,395,363*	*102.3*	*1,218,426*	*95.2*	*1,438,357*	*95.4*	*24,052,146*	*101.5*	*1,870,307*	*12.86*
April	7,015,611	100.5	404,095	94.6	365,570	72.7	7,785,276	98.4	1,814,750	4.29
* May	6,889,230	95.6	400,741	90.9	299,751	57.7	7,589,722	92.9	1,713,256	4.43
† June	5,945,317	85.2	349,196	81.8	206,819	41.1	6,501,332	82.2	1,515,462	4.29
† *2nd Quarter*	*19,850,158*	*93.8*	*1,154,032*	*89.1*	*872,140*	*57.2*	*21,876,330*	*91.2*	*1,681,501*	*13.01*
† *1st 6 months*	*41,245,521*	*98.0*	*2,372,458*	*92.1*	*2,310,497*	*76.2*	*45,928,476*	*96.3*	*1,775,357*	*25.87*
July										4.42

† Preliminary figures, subject to revision.
* Revised.

YEAR 1948

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production (Net tons)	Number of weeks in month
	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		
January	6,770,831	95.6	343,263	77.5	366,784	80.2	7,480,878	93.7	1,688,686	4.43
February	6,247,491	94.4	340,689	82.3	359,837	84.2	6,948,017	93.1	1,678,265	4.14
March	6,845,777	96.6	363,334	82.0	409,659	89.6	7,618,770	95.4	1,719,813	4.43
1st Quarter	*19,864,099*	*95.5*	*1,047,286*	*80.6*	*1,136,280*	*84.7*	*22,047,665*	*94.1*	*1,695,974*	*13.00*
April	5,640,273	82.2	185,140	43.2	399,074	90.1	6,224,487	80.5	1,450,929	4.29
May	6,801,633	96.0	355,659	80.3	423,350	92.6	7,580,642	94.9	1,711,206	4.43
June	6,484,114	94.5	356,907	83.2	424,228	95.8	7,265,249	94.0	1,693,531	4.29
2nd Quarter	*18,926,020*	*91.0*	*897,706*	*69.0*	*1,246,652*	*92.8*	*21,070,378*	*89.9*	*1,619,552*	*13.01*
1st 6 Months	*38,790,119*	*93.3*	*1,944,992*	*74.8*	*2,382,932*	*88.8*	*43,118,043*	*92.0*	*1,657,749*	*26.01*
July	6,348,611	89.8	325,080	73.6	401,826	88.1	7,075,517	88.8	1,600,796	4.42
August	6,633,443	93.6	371,306	83.8	442,085	96.7	7,446,834	93.3	1,681,001	4.43
September	6,594,499	96.3	387,259	90.5	443,086	100.3	7,424,844	96.2	1,734,777	4.28
3rd Quarter	*19,576,553*	*93.2*	*1,083,645*	*82.6*	*1,286,997*	*95.0*	*21,947,195*	*92.7*	*1,671,530*	*13.13*
9 Months	*58,366,672*	*93.2*	*3,028,637*	*77.4*	*3,669,929*	*90.8*	*65,065,238*	*92.2*	*1,662,372*	*39.14*
October	7,120,753	100.5	409,657	92.5	466,485	102.0	7,996,895	100.1	1,805,168	4.43
November	6,925,043	100.9	411,161	95.9	461,354	104.2	7,797,558	100.8	1,817,613	4.29
December	6,927,689	98.0	393,717	89.1	459,373	100.7	7,780,779	97.7	1,760,357	4.42
4th Quarter	*20,973,485*	*99.8*	*1,214,535*	*92.5*	*1,387,212*	*102.3*	*23,575,232*	*99.5*	*1,794,158*	*13.14*
2nd 6 Months	*40,550,038*	*96.5*	*2,298,180*	*87.5*	*2,674,209*	*98.6*	*45,522,427*	*96.1*	*1,732,867*	*26.27*
Total	79,340,157	94.9	4,243,172	81.2	5,057,141	93.7	88,640,470	94.1	1,695,495	52.28

Note—The percentages of capacity operated are calculated on weekly capacities of 1,599,286 net tons open hearth, 99,962 net tons Bessemer and 103,228 net tons electric ingots and steel for castings, total 1,802,476 net tons; based on annual capacities as of January 1, 1948 as follows: Open hearth 83,610,690 net tons, Bessemer 5,226,000 net tons, Electric 5,396,770 net tons, total 94,233,460 net tons.

Construction for '49 May Set A Record; Rapid Rise Noted In Public Expenditures

Washington

• • • **Despite lagging** industrial and commercial fields, 1949 seems likely to set a new record of $19 billion for construction. Commerce Dept. figures show that first half construction is now past the $8.5 billion mark with the seasonal peak yet to come.

Moreover, aided by the recently enacted housing program, construction activity seems destined to continue at high levels for some time to come, providing a relatively good market for steel products.

Various construction activities this year are expected to require around 13 million tons of steel materials. On this basis, between 10 and 12 million tons will be needed for each of the next 2 years.

Noticeable in the commerce statistics is the rapid rise in public construction activity. About $2.2 billion of the total spent this year has come from public coffers, a 37 pct increase over the first half in 1948.

Further, there seems to be little chance of reduction in public construction. Under the new housing legislation alone, the government is committed to spending about $14 billion over a period of 40 years. There is certain to be increased highway construction.

Public housing accounts for the bulk of the new program. It calls for construction of 810,000 home units within 6 years (The White House asked for 1 million units over 7 years). Part of the cost will consist of subsidies, beginning at $85 million and rising to $300 million for the fifth and each subsequent year.

A slum clearance program is provided, consisting of $1 billion for loans and a half-billion in grants—on a matching basis of two local dollars for one federal dollar. A quarter-billion farm housing program is included, partly in loans and partly in grants for farms which are not self-sustaining.

Full effect of the new housing program is not likely to be felt before the spring upturn next year, although federal housing officials expect to get started on perhaps as many as 50,000 units before that time.

For the first half 1949, industrial construction was off 22 pct, dropping from $700 million in 1948 to about $550 million so far this year. Stores and other commercial type structures were also off (17 pct) to a monthly rate of $65 million.

A 12 pct upswing is noted for public utilities as materials become more available and is now running at the rate of $300 million monthly. The bulk of the increase is reported by power and natural gas systems.

New England Council Retains Engineer To Make Study on Steel

Boston

• • • **A further step** toward the development of a New England steel industry was taken here last week by the Iron and Steel Supply Committee of the New England Council.

The services of John E. Kelly, consulting mining and petroleum engineer and economist in metals, have been retained for a study of New England's position as a steel producer and consumer.

In reporting this step, Committee Chairman Frederick S. Blackall, Jr., past president of the Council and president and treasurer of the Taft-Peirce Manufacturing Co., said:

"Interest on New Enland's part in America's steel production has followed recent Canadian mining developments and the rapid growth of New England's metalworking industries, which today employ 36.5 pct of the region's labor force. Labrador-Quebec ores, which have a higher iron content than those of the Mesabi, will become available in 1952, according to operators of the northern mines. The Council committee understands that this ore can be laid down on the New England coast at approximately the same price that Mesabi ore can be laid down in Duluth, and we now believe that an integrated steel plant is economically feasible for New England.

"Mr. Kelly has already left for Labrador to begin an investigation of ore costs and transportation problems. If the results of his research indicate that New England can support a profitable steel industry, the Council committee will endeavor to develop this opportunity for the region's further industrial expansion."

For a full report on New England's hopes and efforts for expanding its steelmaking capacity see THE IRON AGE, *Jan. 27, 1949, p. 109.—Ed.*

TIME SAVER: *New type self-contained hydraulic crane scale made by The Baldwin Locomotive Works simplifies the weighing of incoming material. Loads are transmitted by an Emery cell, long used on testing machines, to a precision type Bourdon tube, the deflection of which moves the pointer on the dial.*

Awarded Dam Work

Portland

• • • **Northwest Marine** Iron Works has been awarded contracts for machinery for government built dams amounting to approximately $360,000 and will include crest gate hoist for the Bull Stone Reservoir project, West Virginia, tainter gate operating machinery for the Bull Shoals Dam, Arkansas, and jet valves for the Bonny Dam on the Missouri River.

Viewing the News from

The ECONOMIC SIDE

By JOSEPH STAGG LAWRENCE

"Union Sin"

"THIS slanderous and untruthful report charges our union with gangsterism, racketeering, collaboration with employers, and every conceivable sin of which a union and its officers could be guilty."

This is Walter Reuther, assailing the publication of a report suppressed for 2 years, detailing charges of gambling and racketeering within the Paterson local of the UAW. Its tardy publication was contrived by a left-wing faction within the union for the apparent purpose of embarrassing Reuther.

With the tactics of intra-union warfare we have little concern except insofar as they may aggravate a labor situation already sufficiently disturbed by strikes and the threat of strikes. However, when an able and powerful union leader places "collaboration with employers" in the same category of union sin as gangsterism and racketeering, it reveals a state of mind which is shocking. If the gulf that divides labor and management is unbridgeable, if the conflict of interest is irreconcilable, if the possibility of a common goal is absolutely rejected, then our whole national labor policy is futile.

This policy, growing out of theories of sound labor relations expounded in our schools, resting upon Federal and State legislation passed after the most careful deliberation, elaborated and interpreted in numerous court decisions, rests on certain patent premises, premises on which the two major parties are in substantial agreement.

The first is that no essential conflict of interest exists between labor and management which cannot be compromised with justice for all parties, given patience, adequate information, and men of good will on both sides.

The second premise of national labor policy is that neither side, labor nor management, can profit in the long run by the complete subordination of the other. The Wagner Act was passed because Congress felt the scales had been unfairly loaded against labor. When this law proved to be too extreme on the side of labor, the Taft-Hartley Act was passed to redress the bias.

The third premise is that labor and management realize their maximum profit when they cooperate; that it is as unwise for management to try to hog all the benefits of cooperation as it is for labor. Management knows that high wages and full employment are better—for management and stockholders—than starvation wages and mass unemployment. Similarly, labor can have neither ample work nor good wages if the employer is forced to operate continuously in the red. This can lead only to bankruptcy and ultimate socialization.

These premises are elementary, axiomatic and self-evident.

The statement of Walter Reuther reveals a spirit that is bitter and intransigent. It implies a class antagonism so profound as to bar any formula for peace except the complete capitulation of one party or the other. It means that labor is heading for the socialist state, an English duplicate, with its leaders in the seat of political power.

It means further that no concessions by the employer in the way of wages, hours, working conditions, or fringe benefits can do more than provide a precarious peace of a few months' duration. As long as we have labor leaders who rate "collaboration with employers" among the cardinal sins of the working man, there is no point in making any concessions. Walter Reuther sounds more like Marx than Gompers.

Russian Manganese Ore Boat Is Second In July; 3 More Due

Philadelphia

• • • **A boatload of** manganese ore arrived here last week from the Soviet Union, the second shipment to reach the United States this month from Russia. These are the first arrivals since April, the last month in which Russian manganese ore was received in this country. It is believed that 3 or 4 more boatloads will be landed within the next month to bring the total for this movement to 50,000 tons.

Imports of Russian manganese began to drop sharply in January of this year. None came in at all during March but several boatloads arrived in April. That was the end until some 10,000 tons were unloaded at Baltimore early this month.

Increased receipts from South Africa and India, coupled with declining steel operations have now put American buyers in a position to ignore the cut-off made by Russia this spring. These other countries have so increased their output that steelmaking was not affected by the Soviet action. Since their potential output is well above what they are shipping now, steel company raw materials men feel that by the time steelmaking again pushes capacity they'll be able to carry the load.

This prospect may have worried sales agents of the U.S.S.R., who may now be willing to ship ore here at a reasonable price rather than lose the market. Australia recently bought 10,000 tons from Russia to offset a dip in its receipts from India.

Nonferrous Mines Close

Salt Lake City

• • • **Failure of** operators to convince miners that a $2.50 per shift wage reduction was necessary in order to keep the mines operating profitably has resulted in closure of at least three workings.

Silver King Coalition Mines Co. has closed up and laid off about 300 men; Park Utah Consolidated Mining Co. closed with a layoff of about 200 men; and New Park Mining Co. closed down and laid off 250 men.

Sunbeam STEWART

THE BEST INDUSTRIAL FURNACES MADE

Regardless of whether you heat treat in small quantities or continuous production, Sunbeam Stewart engineers are well qualified to recommend the correct furnaces to meet your requirements.

As a division of Sunbeam Corporation we have the opportunity of working with our furnaces in the production of Sunbeam appliances, lawn sprinklers, sheep shears, animal clippers, etc. In manufacturing our own products we must contend with practically every heat treating problem faced by industry—a position unique in the furnace manufacturing field.

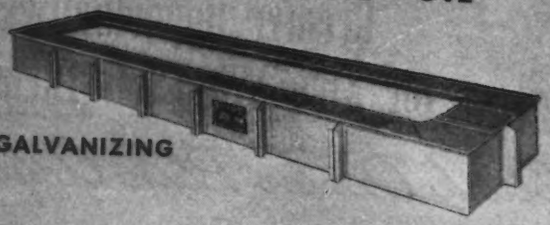
This experience with our own furnaces in both small or large volume production enables us to render a service to you far beyond other manufacturers. That is one reason why Sunbeam Stewart Furnace installations have been so successful. They are based not only on furnace engineering ability, but on practical experience under actual operating conditions. We have learned through actual experience the factors that give longest furnace life . . . greatest production . . . best quality . . . and lowest operating cost.

Our highly trained technical staff of furnace engineers, who for over 50 years have built furnaces for the leading companies throughout the United States and abroad, are qualified to recommend the correct type of furnace to meet your requirements.

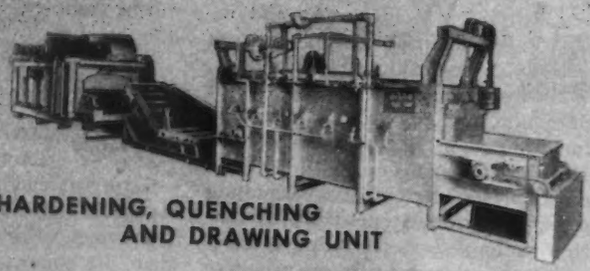
A letter, wire or 'phone call will promptly bring you information and details on Sunbeam Stewart Furnaces, either units for which plans are now ready or units especially designed to meet your needs. Or, if you prefer, a Sunbeam Stewart engineer will be glad to call and discuss your heat treating problem.

THERE IS A SUNBEAM STEWART INDUSTRIAL FURNACE FOR EVERY NEED

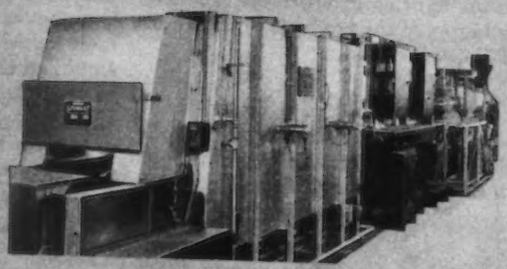
GAS · ELECTRIC · OIL



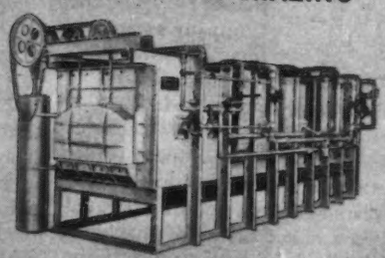
GALVANIZING



HARDENING, QUENCHING AND DRAWING UNIT



FURNACE BRAZING



PORTABLE OVEN FURNACE

FREE Vest-Pocket Heat Treating Data Book. MAIL today. CHECK for information on furnaces to meet your needs.

- ☐ Atmosphere-controlled
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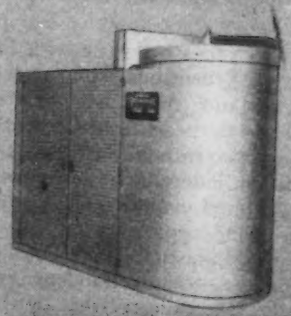
- ☐ Gas nitriding
- ☐ High speed steel
- ☐ Metal melting
- ☐ Oven
- ☐ Pot
- ☐ Recirculating
- ☐ Rivet heaters
- ☐ Rotary hearth forge
- ☐ Soldering iron heaters
- ☐ Tempering
- ☐ Tool hardening

NAME_____ TITLE_____

COMPANY_____

ADDRESS_____ CITY_____ STATE_____



RECIRCULATING FURNACES

SUNBEAM STEWART INDUSTRIAL FURNACE DIVISION of SUNBEAM CORPORATION

(Formerly CHICAGO FLEXIBLE SHAFT CO.)

Main Office: Dept. 110, 4433 Ogden Ave., Chicago 23—*New York Office:* 322 W. 48th St., New York 19—*Detroit Office:* 3049 E. Grand Blvd., Detroit 2

Canada Factory: 321 Weston Rd., So., Toronto 9

Greater Service to Fork-Truck Users

Greater Opportunities for Men Who Sell Them—

Clark Dealer Plan Achieves Both

WITH sales of its fork-lift trucks and industrial towing tractors exceeding all expectations, and with its position of production and engineering leadership firmly rooted in rich, productive soil, Clark Equipment Company, in its 30th year as a builder of materials-handling machines, has found it desirable to establish a nation-wide organization of independent franchised dealers as exclusive distributors of the products of its Industrial Truck Division.

THIS is indeed a far cry from 1939 when the entire output of the Industrial Truck Division was sold with ease by a handful of men!

TODAY'S volume is twenty times that of 1939; and the Company's stature—financial and engineering—is more than twenty times as great as in 1939. A considerable number of the '39 machines are in daily service, and many older machines are in regular operation after 20 and 25 years. The conviction is natural that 30 years hence many '49 machines will still be "on the job" alongside the new output of 1979. There will be no "orphans" bearing the name "Clark."

TO KEEP PACE with increasing demands, and to deliver the broad and competent service which Industry expects from Clark, the Company has chosen this plan of selling through independent dealers as a sound and logical evolution. Until the middle of 1948, approximately one-third of Clark's Industrial Truck Division representatives were on an independent dealer basis. It is expected that by the end of 1949 the nation-wide dealer organization will be complete.

HEADING up the dealerships or actively participating in them are key men of Clark's erstwhile factory-branch sales offices—factory-trained men, tested and proved as capable materials-handling counselors. These men share with Clark management the conviction that they can deliver, under the new plan, a broader and more valuable service to their customers and to all users of mechanized materials-handling; that they face broader, deeper vistas of opportunities which ambitious men so earnestly desire—opportunities for independence, for building greater earnings by their own efforts, for achieving prestige and leadership in their communities.

ANOTHER influence which furthered the plan is the fact that Clark management historically has been engineers and manufacturers. By decentralizing marketing activities, Clark can intensify its emphasis on development of better materials-handling machines and methods—to the end that Clark products shall achieve even higher excellence at lower cost, shall become still more valuable to industrial users and to the dealers who serve them.

THROUGH your Clark dealer, all the advantages of Clark engineering, integrated production and matchless experience are quickly available to you. He is fully qualified to make an unbiased appraisal of your materials-handling operations, and to recommend the type of machine that will serve you most efficiently at lowest cost. It's "good business" to CONSULT CLARK.

CLARK EQUIPMENT COMPANY

INDUSTRIAL TRUCK DIVISION

BATTLE CREEK 51, MICHIGAN

OTHER PLANTS—BUCHANAN • JACKSON • BERRIEN SPRINGS, MICHIGAN

REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE WORLD

AUTHORIZED CLARK DEALERS

ALABAMA: BIRMINGHAM
*M-H EQUIPMENT COMPANY
845 LOMB AVENUE

ARIZONA: PHOENIX
ROBERT H. BRAUN COMPANY
743 GRAND AVENUE

ARKANSAS: LITTLE ROCK
FRED J. VANDEMARK COMPANY
209 EAST MARKAM STREET

CALIFORNIA: FRESNO 1
ROBERT H. BRAUN COMPANY
505 MASON BUILDING

LOS ANGELES 23
*ROBERT H. BRAUN COMPANY
3008 EAST OLYMPIC BLVD.

OAKLAND 3
*GLEN L. CODMAN COMPANY
10521 PEARMAIN STREET

STOCKTON
GLEN L. CODMAN COMPANY
409 BELDING BUILDING

COLORADO: DENVER 2
J. N. MEADE
420 U. S. NATIONAL BANK
Service: FORK LIFT TRUCK SERVICE
2855 WEST 8TH AVENUE

CONNECTICUT: NEW HAVEN
*C. E. REUTTER CORPORATION
66 AMITY ROAD

FLORIDA: TAMPA
CLARK EQUIPMENT COMPANY
1145 ELLAMAE STREET

GEORGIA: ATLANTA
M-H EQUIPMENT CO.
(CONTACT BIRMINGHAM)

ILLINOIS: CHICAGO 4
MODERN HANDLING EQUIP., INC.
310 SOUTH MICHIGAN AVENUE
(Service: Cook County)
LIFT TRUCK SERVICE COMPANY
6919 SOUTH HALSTED STREET

INDIANA: INDIANAPOLIS 5
*W. A. MARSCHKE & SONS
1121 E. 46TH STREET

SOUTH BEND 14
*MATERIALS HANDLING EQUIP. CO. OF SOUTH BEND, IND.
2625 SOUTH MICHIGAN STREET

IOWA: DAVENPORT
BIG RIVER EQUIPMENT CO.
1344 WEST THIRD STREET
Service: DAVENPORT ALL-WHEEL-DRIVE CO.
1344 WEST THIRD STREET

DES MOINES
*BIG RIVER EQUIPMENT CO.
914 GRAND AVENUE, ROOM 255

KANSAS: KANSAS CITY
Sales and Service:
(SEE KANSAS CITY, MISSOURI)

WICHITA
Service: GENERAL ENGINE & EQUIPMENT CO.
218-220 SOUTH WICHITA

LOUISIANA: NEW ORLEANS
T. G. FRAZEE
910 CARONDELET BLDG.

MAINE: PORTLAND
BRODIE INDUSTRIAL TRUCKS, INC.
465 CONGRESS STREET

MARYLAND: BALTIMORE
*FALLSWAY SPRING & EQUIPMENT CO.
CORNER FALLSWAY & LEXINGTON

MASSACHUSETTS: BOSTON (MALDEN 48)
*BRODIE INDUSTRIAL TRUCKS, INC.
50 COMMERCIAL STREET, MALDEN 48

MICHIGAN: BATTLE CREEK
*CLARK EQUIPMENT COMPANY
INDUSTRIAL TRUCK DIV. PLANT

DETROIT 2
CLARK EQUIPMENT COMPANY
6520 CASS AVENUE
Service: INDUSTRIAL TRUCK SERVICE, INC.
8815 HARPER AVENUE

MINNESOTA: MINNEAPOLIS 2
MATERIAL HANDLING ENGINEERS
225 SOUTH 5TH STREET, ROOM 201
Service: SMITH-DUNN COMPANY, INC.
2301 UNIVERSITY AVENUE, S. E.

MISSOURI: KANSAS CITY 6
CLARK EQUIPMENT COMPANY
1009 BALTIMORE AVENUE
Service: LIFT TRUCK SERVICE & SUPPLY
NORTHWEST 15TH AND McGEE STREETS

ST. LOUIS 8
MATERIALS HANDLING EQUIPMENT CORP.
3820 WASHINGTON BLVD.
Service: FORK LIFT TRUCK SERVICE CO.
511 NORTH CHANNING AVENUE

AUTHORIZED CLARK DEALERS

NEW JERSEY: JERSEY CITY
JERSEY INDUSTRIAL TRUCKS, INC.
34 EXCHANGE PLACE
Service: BOND INDUSTRIAL MAINTENANCE CO.
51 CLARKSON STREET AT GREENWICH, N. Y. 14

NEW YORK: BUFFALO
*BRODIE INDUSTRIAL TRUCKS INC.
1450 MICHIGAN AVENUE
NEW YORK 6
*BOND INDUSTRIAL EQUIPMENT CO.
165 BROADWAY, ROOM 2200 (OFFICE)
Service and Display Room:
51 CLARKSON STREET AT GREENWICH, N. Y. 14
also 289 BOND STREET, BROOKLYN 31
SYRACUSE
BRODIE INDUSTRIAL TRUCKS INC.
712 STATE TOWER BLDG.
ALBANY (WATERVLIET)
*INDUSTRIAL TRUCK SALES, INC.
BROADWAY AT 25TH, WATERVLIET

NORTH CAROLINA: CHARLOTTE
CLARK EQUIPMENT CO.
416 KESWICK AVE.
GREENSBORO
Service Outlet only:
INDUSTRIAL TRUCK SERVICE CORP.
629 SOUTH SPRING STREET

OHIO: CINCINNATI 9
*ROBERT C. YOUNG & CO.
4453 34TH AVENUE
CLEVELAND
CLARK EQUIPMENT COMPANY
522 ROCKEFELLER BLDG.
TOLEDO 10
P. L. REYNOLDS, 2558 FULTON STREET
Service: WILLIS DAY STORAGE CO.
801 WASHINGTON STREET

OKLAHOMA: TULSA
ARST EQUIPMENT COMPANY
34 NORTH MADISON

OREGON: EUGENE
PRESTON FALLER COMPANY
891 TAYLOR STREET
PORTLAND 5
PRESTON FALLER COMPANY
1220 S. W. MORRISON STREET

PENNSYLVANIA: HARRISBURG
BRODIE INDUSTRIAL TRUCKS, INC.
3229 MEADOW LANE
PHILADELPHIA 22
BRODIE INDUSTRIAL TRUCKS, INC.
1605-23 NORTH FRONT STREET
Service:
PHILADELPHIA ENGINE REBUILDERS, INC.
330 WEST QUEENS LANE
PITTSBURGH
*MATERIAL HANDLING INCORPORATED
319 THIRD AVENUE

SOUTH CAROLINA: COLUMBIA
M-H EQUIPMENT CO.
(CONTACT BIRMINGHAM)

SOUTH DAKOTA: SIOUX FALLS
CENTURY EQUIPMENT & SUPPLY CO.
22 WEST 7TH STREET

TENNESSEE: MEMPHIS 3
*FRED J. VANDEMARK COMPANY
1110 UNION AVENUE

TEXAS: DALLAS
T. G. FRAZEE
1012 FIRST NATIONAL BANK BLDG.
Service: TRUCK EQUIPMENT COMPANY
2409 COMMERCE STREET
HOUSTON
*T. G. FRAZEE, 810 PETROLEUM BLDG.

UTAH: SALT LAKE CITY
ALBERT J. ISAACSEN CO.
45 SOUTH 3RD WEST STREET

VIRGINIA: NORFOLK
*McLEAN-SHAND, INC.
955 WEST 21ST STREET

WASHINGTON: SEATTLE 1
*PRESTON FALLER COMPANY
1921 MINOR AVENUE
SPOKANE 9
PRESTON FALLER COMPANY
EAST 41 GRAY AVENUE

WISCONSIN: MILWAUKEE 2
CLARK EQUIPMENT COMPANY
759 NORTH MILWAUKEE AVENUE, ROOM 623
Service: LIFT TRUCK SERVICE CO.
5710 WEST NATIONAL AVE., WEST ALLIS, WIS.

DISTRICT OF COLUMBIA: WASHINGTON
CLARK EQUIPMENT COMPANY
927 15TH STREET N. W.

TERRITORY OF HAWAII: HONOLULU
*PRESSED STEEL CAR COMPANY
538 REED LANE, P. O. BOX 300

*Sales and Service Combined.

Construction Steel . . .

• • • **Fabricated steel awards** this week included the following:

1500 Tons, Buffalo, N. Y., medical and surgery building, State hospital, to Bethlehem Steel Co., Bethlehem, through John W. Cowper Co., general contractor.

410 Tons, Mendocino Co., Calif., bridge across Salmon Creek near Albion, to Judson Pacific Murphy Corp., Emeryville, Calif.

250 Tons, Buffalo, N. Y., boiler house, State hospital, to Buffalo Structural Steel Corp., Buffalo, N. Y., through John W. Cowper Co., general contractor.

165 Tons, Birmingham, crane runway for Chicago Bridge & Iron Co., to Virginia Bridge Co., Birmingham.

110 Tons, New York, 6-story apartment house, Greenwich St., to Grand Iron Works, New York.

• • • **Fabricated steel inquiries** this week included the following:

220 Tons, Jefferson Co., Colo., structures on State Highway 20 between Huntsman Gap and Mother Grundy, State Highway Engineer, Denver, bids to July 26.

• • • **Reinforcing bar awards** this week included the following:

750 Tons, Buffalo, N. Y., state hospital additions, to Buffalo Steel Co., Tonawanda, N. Y., through John W. Cowper Co., general contractor.

360 Tons, Birmingham, Crippled Children's Hospital, to Ceco Steel Products Corp., Birmingham.

• • • **Reinforcing bar inquiries** this week included the following:

730 Tons, Tracy, Calif., structures on Delta-Mendota Canal near South Dos Palos, Bureau of Reclamation, Tracy, Spec. 2732, bids to Aug. 16.

Plans Poster Campaign For Reuther Assassins

Detroit

• • • **In the near future** the Detroit Police Dept. plans to send out 60,000 posters to police stations throughout the world and another 40,000 to post offices announcing the terms of $218,000 in rewards for information leading to the arrest and conviction of would-be assassins of Walter and Victor Reuther, top UAW officials. The union is offering $200,000 reward for the capture of the would-be killers.

The posters give a full description and pictures of the shotgun found outside Walter Reuther's house after the shooting.

Hoover Report

(CONTINUED FROM PAGE 137)

reau of Federal Supply and Office of Contract Settlement from the Treasury Dept.; the National Archives Establishment, and the War Assets Administration. The name of the PRA has been changed to Bureau of Public Roads.

As Mr. Larson puts it, GSA will, in its supply function, aim to bring about maximum use and minimum purchases of federal property and nonpersonal services. This, he says, will be accomplished by establishing uniform policies.

"GSA will continue to maintain centralized purchasing where that is most advantageous to the government," he explains, pointing out that such procedures are aimed at preventing losses to the government through competition of executive agencies for the same items in the same market, unnecessary buying, lack of quantity purchases, and the purchasing of articles by one agency when they are carried as excess by another.

Purchases are now made by the Washington headquarters of the BFS and also by various supply centers which are located in New York, Boston, Cleveland, Chicago, Kansas City, Atlanta, Fort Worth, Denver, San Francisco, Long Beach and Seattle, as well as by individual departments for needs of all governmental agencies.

Just how much money—if any—GSA will save the taxpayers this year is still in doubt. If Mr. Larson is successful in carrying out the intent of Congress, savings should certainly begin to show up within the next several years.

As far as carrying out the true intent of the Hoover program is concerned, the halting progress represented by the creation of GSA is a move of debatable value. Congress and the Executive branch of the government have never been backward about creating new bureaus, particularly when coupled with an opportunity to add new jobholders to the already swollen federal pay roll.

Possibly both the Congress and Mr. Truman have temporarily lost light of the fact that what Mr. Hoover really had in mind was increased federal efficiency through a decrease—certainly not an increase—in the number of federal jobholders.

ATLAS

STRIP HANDLING EQUIPMENT

● **Strip steel can be handled very economically on rail cars as compared with other means of conveyance. Strip cars can be handled by heavy-duty rubber tired tractors or by locomotives running on the track rails, or they can be self-propelled motor-driven with power supplied by storage battery in the car.**

125-Ton DOUBLE TRUCK CAR
for handling steel strip in rolls. This car is hauled by tractor shown below.

SPECIAL HEAVY-DUTY GAS-ELECTRIC TRACTOR
for hauling 125-Ton Strip Handling Cars. Tractors run on rubber tires.

135-Ton FLAT CAR
Powered by storage battery for handling sheet steel.

25-Ton PLATFORM CAR
Powered by storage battery, operates at slow speed and has operator's platform at each end.

ATLAS ENGINEERING SERVICE IS ALWAYS AT YOUR SERVICE

THE ATLAS CAR & MFG. CO.
ENGINEERS MANUFACTURERS
1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

European Letter

(CONTINUED FROM PAGE 126)

is on the indoctrinated party cadres and the industrial masses that Moscow relies to keep western Europe seething.

The debit side of the balance, for communists, is Yugoslavia, and the loss is serious. Until Moscow deliberately picked its quarrel with Tito, Yugoslavia was the southwestern bastion of the Soviet position in Europe. Through its territory the Soviet Union had access to the Adriatic. Now bitterness and suspicion have reached such a point that Moscow can certainly no longer rely on Tito. Abandonment of support for Yugoslavia's claims against Austria at the Paris Conference last month is only the last of a series of injuries to Yugoslav interests. Though Tito is still far from the subservience to the western powers of which Soviet propaganda accuses him, he is certainly no longer a reliable Soviet vassal. This means that only Albania is left as a lonely outpost of the Soviet empire on the Adriatic. It is true that its ports, Durazzo and Valona, though lacking in modern equipment, possess great strategic importance, as they dominate the Straits of Otranto. Some, at least, of the Soviet military and civil technicians withdrawn from Yugoslavia are now in Albania. Polish, Soviet and Rumanian ships, passing through the Danish Belts, Gibralter or the Dardanelles, are bringing materials required for the projected industrialization of Albania. High among its priorities are the extension and fortification of the ports and the construction of a railway to link them with Albania's eastern frontier. But even if mass labor conscription, police terror and supervision by Soviet engineers could soon accomplish these enormous tasks, the result would be of small value to the Soviet Union as long as the obedient vassal Albania is cut off from the obedient vassal Bulgaria by the Macedonian provinces belonging to Yugoslavia and Greece. Perhaps the most important reason for creating the Dimitrov empire, or South Slav federation, with its enlarged Macedonian republic gravitating towards Sofia rather than Belgrade, would be to give the Soviet Union direct access to

Line sketch shows unusual contour of barrel shaped metal stamping.

AN ACCOMPLISHMENT IN METAL FORMING . . .

An ordinary cylindrical shape presents no particular metal stamping problem. However, to maintain the precise specifications of this barrel shaped body in perfect concentricity presented an unusual and difficult manufacturing problem.

Ribs were provided in the body for strength and to overcome the need for appurtenant reinforcements. Another feature . . . to aid economy in assembling, the bolt head seats were struck flat, eliminating the need for costly machining.

Again Presteel engineering, toolmaking and metal forming techniques made a routine job out of the unusual.

ALLOY STEELS AND OTHER METALS COLD FASHIONED SINCE 1883

Representatives in ALEXANDRIA, VA. • BUFFALO • CANTON, OHIO • CHICAGO
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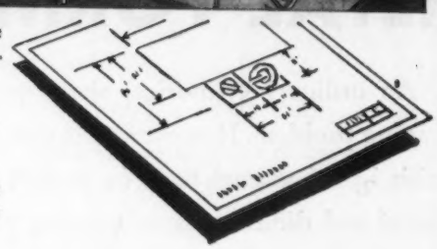
WORCESTER PRESSED STEEL CO.

407 BARBER AVENUE
WORCESTER 6, MASS.

TOP PERFORMANCE WITH AJAX TAMA-WYATT

INDUCTION FURNACES for Aluminum Alloys

Ajax Induction Holding Furnace at Mid-Western Die Casting Co., Chicago, Illinois.



BETTER PRODUCTION THROUGH TOP PERFORMANCE IS THE AJAX RECORD

Ajax-Tama-Wyatt induction furnaces are used in the United States and abroad for melting and holding aluminum alloys in die casting, permanent mold, and sand foundries.

No flux or mechanical stirring is necessary. The metal is in constant gentle circulation assuring complete blending of alloys, and a uniform temperature throughout the metal.

Electric energy costs less than fuel and avoids danger of overheating. Completely automatic temperature controls hold metal to within 5°F., at the lowest possible temperature for perfect casting. With an Ajax the yield for perfect castings is exceptionally high.

There are no fumes and operation is practically noiseless. Shops are cooler, more comfortable—manpower efficiency is increased. Shop space is increased, for an Ajax Holding Furnace takes an average of 30 to 40 per cent less floor space than any other furnace.

The Ajax companies have been pioneers in induction melting of metals since the first World War. To date they have installed more than 400,000 KW. of furnace capacity in the United States alone. This is the background of experience behind every Ajax installation.

AJAX ENGINEERING CORPORATION • TRENTON 7, NEW JERSEY

AJAX TAMA-WYATT INDUCTION MELTING FURNACE

Associate Companies: **AJAX METAL COMPANY,** Non-Ferrous Ingot Metals and Alloys for Foundry Use
AJAX ELECTROTHERMIC CORP., Ajax-Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., the Ajax-Hultgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax-Wyatt Induction Furnaces for Melting

two branches of the Mediterranean, to the Aegean at Salonica and Kavala, and to the Adriatic at Valona and Durazzo. The ghosts of Aehrenthal and Izvolsky might smile to see the revival, in the age of people's democracies, of the Balkan railway-building imperialism of the turn of the century.

Meanwhile, however, resistance in Yugoslavia and Greece is a fact. Tito is perfectly capable of suppressing any revolt among his Macedonians, and there is not even any evidence that his Macedonians wish to revolt. The hold of the Greek rebels over Greek Macedonia is precarious, and the removal of Markos cannot have improved the morale of those of his followers who believed themselves to be fighting, not for Russian imperialism, but for Greek democracy. Civil war has not sufficed to destroy Greece, and in Yugoslavia civil war is not a likely prospect. Invasion of Yugoslavia by Bulgarian or Hungarian troops —of which there is no sign— would be repelled: invasion by Soviet forces would involve unpredictable international risks.

ACCESS to the Mediterranean will remain one of the principal objectives of Soviet policy. To keep the Russians back from the Mediterranean should be one of the principal aims of the western powers. It is worth financial effort to strengthen the Greek economy and to hasten the victory of the Greek army over the rebels. If necessary, more funds must be spent, more experts sent, and more intervention take place in the organization and personnel of Greek government, provided that Greece is thereby strengthened. It is worth short term economic loss to help Yugoslavia resist the Cominform boycott, provided that it is reasonably certain that Tito will in fact use such help to increase his power of resistance. It is worth diplomatic effort to bring the Yugoslav and Greek governments to recognize the lesson of both countries' histories: that when threatened by Bulgarian and Albanian tools of a great power both must stand together. Success or failure in these tasks by the western powers will decide whether the campaign against Titoism will have served or harmed the Soviet cause.

30,000 REASONS

why you should display at the

METAL SHOW

featuring "Economy-in-Production"

31st National Metal Congress and Exposition

CLEVELAND, OHIO

October 17-21, 1949

OVER 30,000 management, engineering and purchasing officials in the Metal Industry will visit and inspect operating displays covering 9 acres of Cleveland's Public Auditorium at the 1949 METAL SHOW.

Already over 300 exhibitors are planning displays to show how their products and services reduce unit costs. "Economy-in-Production" will be the theme of the lectures, papers, round-table discussions in addition to being the high spot in the exhibitors' displays.

If you have not received a copy of REPORT NO. 2 – Continuing Analysis of Attendance at the Metal Show, write for it today. More than 30,000 metal men are classified by business, industry, size of plant, title, occupation and geographically. The Report tells you when visitors attend and how often.

ECONOMY THEATRE

Exhibitors with operating films will have an opportunity to have them shown in the "Economy Theatre" in the Auditorium on regular, published schedules during the entire show. If you have such a film, your products and services get "double exposure" —in your display and in the theatre. Reserve your space NOW!

• *For full information, write:*
W. H. EISENMAN *{Managing Director}*
National Metal Exposition
7301 Euclid Avenue, Cleveland 3, Ohio
or telephone UTah 1-0200

★ ★ ★

• *For hotel reservations, write:*
CLEVELAND HOUSING BUREAU
attention Louise D. Perkins,
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AMERICAN WELDING SOCIETY
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Short Circuits get TOUGHER to handle as POWER Grows

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PERMANENT Protection at one cost

Don't be caught "short" with a "short" your equipment can't handle with safety. EC&M VALIMITOR Starters may be connected to a bus of *any* capacity—the KVA may be infinite.

To restart after a fault—there's nothing to replace—just press the start button. These starters are easy to apply; only motor size, voltage, etc., is needed. No calculations or survey of power system. Specify EC&M VALIMITOR Starters for permanent safety.

Write for No. 23 issue of the EC&M ACCELERATOR

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79th STREET • CLEVELAND 4, OHIO

Industry Permitted To Buy Tin Concentrates For Smelting Purposes

Washington

• • • **President Truman** has signed into law a bill (S 1433) to permit private industry to buy low-grade tin concentrates from the federal government for smelting.

The new law (Public Law 148) authorizes the Reconstruction Finance Corp. to sell to private industry low-grade tin concentrates acquired under the government's exclusive purchasing contracts.

Principal beneficiary of the new statute is the Vulcan Detinning Co., of New Jersey. Vulcan has developed a new chemical process for recovering tin from concentrates which appears capable of recovering tin of high purity and with high yields of from 15 to 25 pct ore concentrates.

Vulcan representatives told the House Banking Committee that it is proceeding with construction of a new plant to cost about $750,000 which will have an initial capacity of about 5 tons of metallic tin per day.

Representative Spence, D., Ky., told the House that RFC's position would be protected in that the processing by private industry of RFC concentrates would be done on no less favorable terms than if the processing were done at the RFC-owned smelter at Texas City, Tex.

"The success of such operations would result in desirable diversification of tin recovery facilities in the United States and would promote the conservation of the tin ore reserves of the Western Hemisphere," Mr. Spence declared.

The Texas City smelter has facilities for treating practically all types of tin concentrates, from impure Bolivian concentrates containing only 18 pct tin to the highest grade alluvial concentrates which average about 74 pct tin.

The 54,098 tons of Bolivian ore which were received at the Texas City smelter last year averaged 37.3 pct in tin content. Of these ore receipts, 14,704 tons were high-grade ores averaging 59.4 pct tin content, 9492 tons were medium-grade ores averaging 44.6 pct tin content, and 29,902 tons were low-grade ores averaging 24.2 pct tin content.

Need Supplies?

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BRASS
COPPER
TIN

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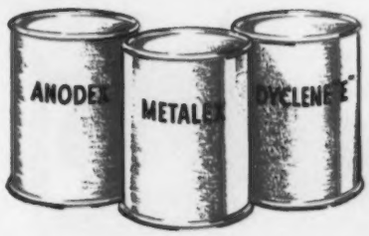
ACIDS



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Every Item for Platers

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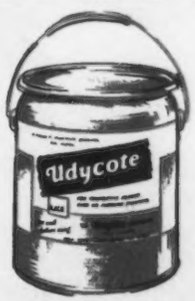

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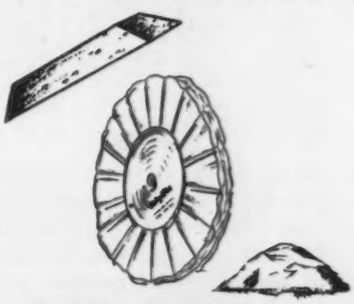

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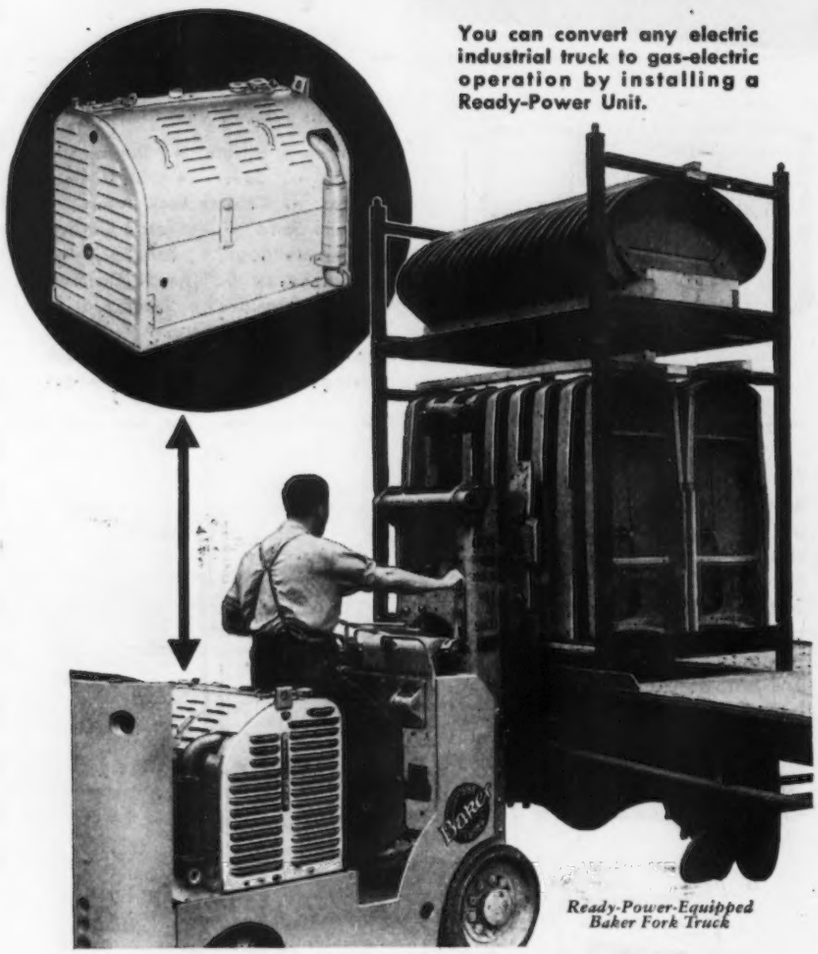

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3822 Grand River Ave., Detroit 8, Michigan

Iron, Steel and Scrap Imports Continue To Decline During April

Washington

• • • **Iron and steel** imports continued to decline in volume during April according to recent Commerce Dept. and American Iron & Steel Institute reports.

A total of 44,143 net tons of iron and steel products was imported during the month, bringing the total for the first 4 months of 1949 to 298,988 net tons.

In addition to the product tonnage, another 118,839 tons of scrap arrived at U. S. ports during the month, to bring to 712,545 tons the total scrap import tonnage for the first 4 months of the year.

Sharp decreases were reported for structural shapes and piling, as well as for pig iron. In previous months, these two categories accounted for substantial percentages of the overall volume.

Net tonnages of iron and steel imports as compiled by the institute from Commerce Dept. figures are as follows:

	April 1949	First 4 Months 1949
Semifinished and Finished Products:		
Steel ingots, blooms, etc..	2,574	19,178
Wire rods	539	2,003
Iron bars and slabs	46	182
Concrete reinforcement bars	1,671	4,077
Hollow bar and drill steel	6	11
Other steel bars	3,196	17,614
Boiler and other plate	4,558	14,669
Sheets, skelp, sawplates, n.e.c.	3,590	6,143
Tin plate, tagger's tin and terne plate	24	28
Other hoops and bands	619	5,271
Structural shapes and sheet piling	13,032	107,011
Rails and fastenings	75	702
Wheels and axles	46	64
Pipe and tubes	943	3,100
Round wire	1	9
Barbed wire	—	—
Flat wire and strip	200	590
Telegraph and telephone wire	—	83
Wire rope and strand	24	211
Wire fencing	—	—
Nails, tacks and staples..	381	1,007
Bolts, nuts and rivets....	6	34
Castings and forgings	8	41
Die blocks and blanks	—	637
Total	31,539	182,665
Other Finished Products:		
Cast iron pipe and fittings	11	113
Malleable iron pipe fittings	1	3
Enameled or glazed ware utensils	—	—
Power transmission and other chains	22	64
Total	34	180
Pig iron	2,488	71,355
Sponge iron	253	1,115
Ferromanganese (manganese content)	8,470	36,581
Spiegeleisen	—	—
Ferrosilicon (silicon content)	44	312
Ferrochrome (chromium content	510	1,377
Other alloys used in steel manufacturing	805	5,403
Total	12,570	116,143
Grand total	44,143	298,988
Iron and steel scrap	118,839	712,545

TINNERMAN

Speed Nut Savings Stories

"BETTER ASSEMBLY for Half the Cost"

REPORTS **Lovell** WORLD'S LARGEST MANUFACTURERS OF WRINGERS
Erie, Pennsylvania

"We first considered the use of a grooved shaft and a drop-in pin as the best method of applying a plastic knob to the Lovellette wringer handle," states Mr. W. L. Kauffman, Chief Engineer of Lovell Manufacturing Co. "We found, however, that the easy attachment and secure locking provided by Tinnerman SPEED NUTS made a better assembly. We were also pleased to discover that the SPEED NUT assembly cost was about one-half as much as the other method considered!"

This 50% saving is another positive demonstration of the cost-reducing, product-improving qualities of the SPEED NUT brand of fasteners. To learn how effectively SPEED NUT assembly advantages can be adapted to your product, call in your Tinnerman representative—he's listed in major city phone directories. TINNERMAN PRODUCTS, INC., 2040 Fulton Road, Cleveland 13, Ohio. In Canada: Dominion Fasteners Limited, Hamilton.

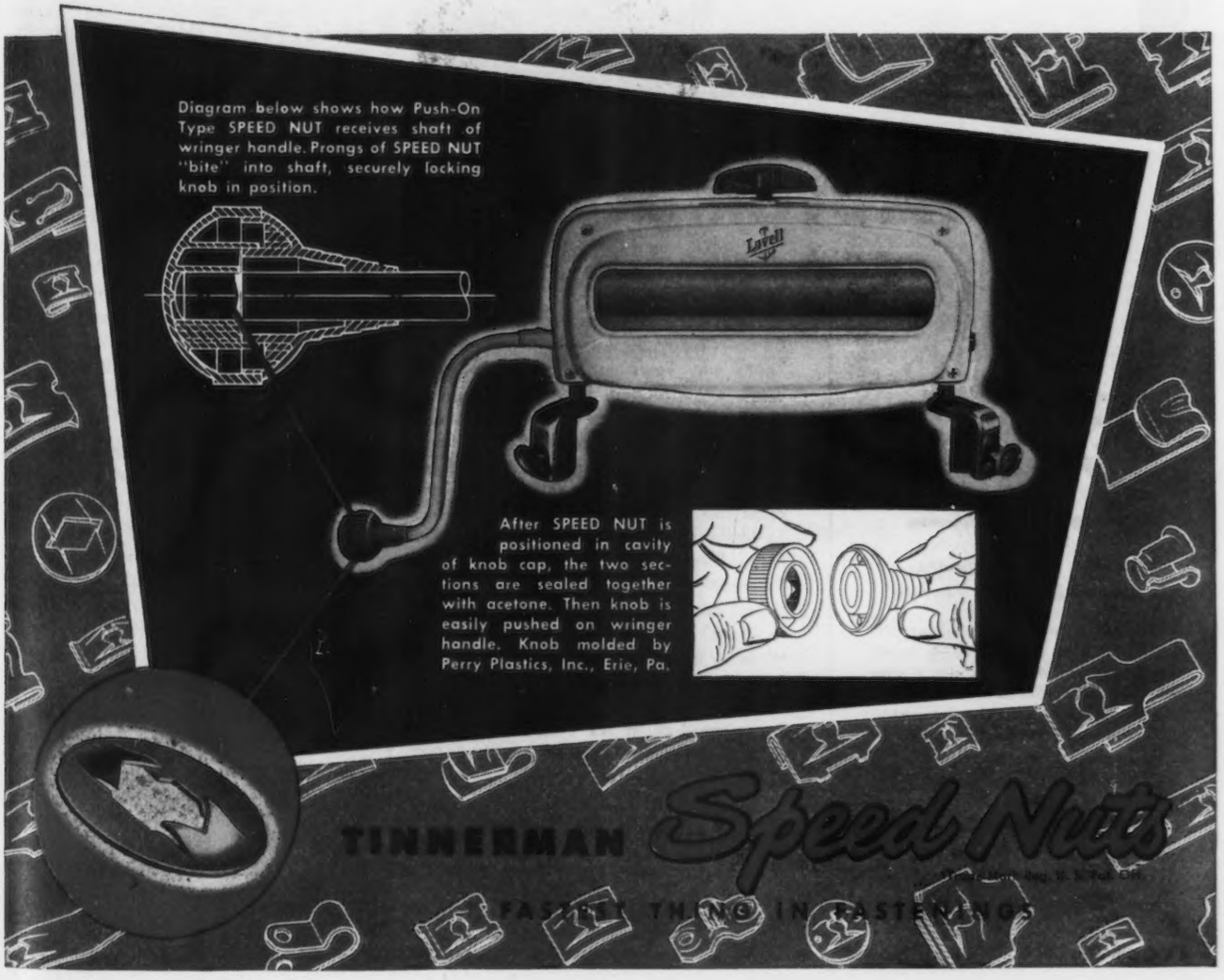
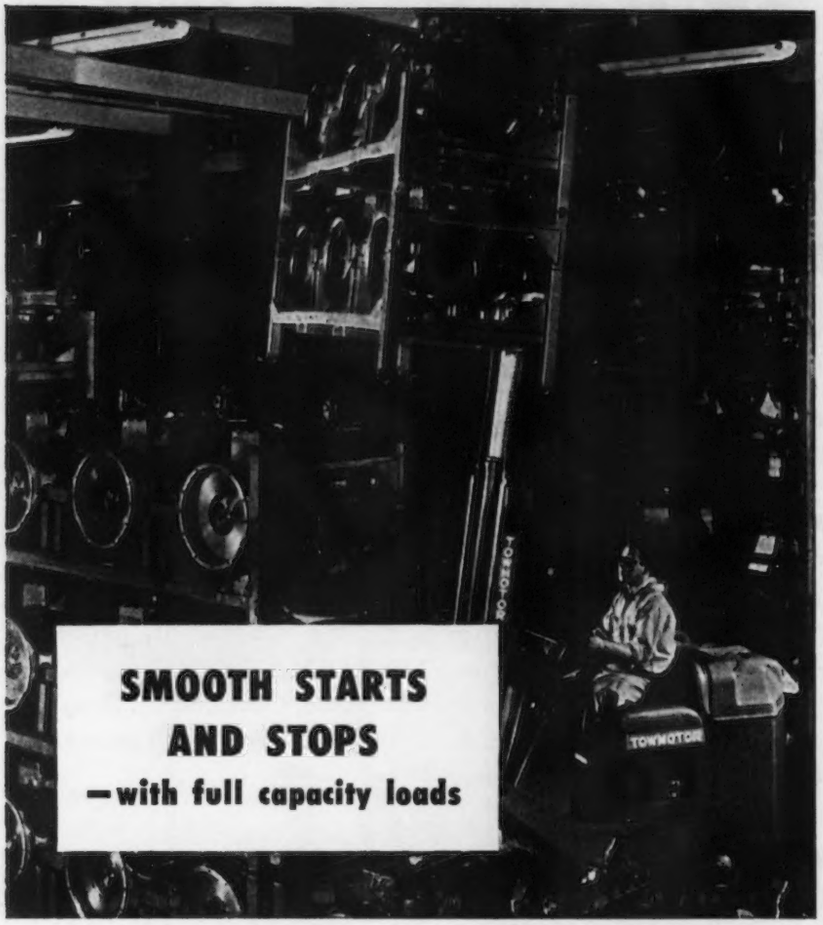


Diagram below shows how Push-On Type SPEED NUT receives shaft of wringer handle. Prongs of SPEED NUT "bite" into shaft, securely locking knob in position.
Lovell
After SPEED NUT is positioned in cavity of knob cap, the two sections are sealed together with acetone. Then knob is easily pushed on wringer handle. Knob molded by Perry Plastics, Inc., Erie, Pa.
TINNERMAN Speed Nuts



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Use of Electrolytic Manganese Successful In Foundry Practice

Washington

• • • **Successful** experimental use of electrolytic manganese in the production of steel castings is described in a recent publication of the Bureau of Mines. One of a series of reports dealing with the application of electrolytic manganese to steel-foundry practice, the publication reviews metallurgical tests conducted by the bureau in cooperation with the National Malleable & Steel Castings Co.

To study the feasibility of substituting electrolytic manganese for ordinary grades of ferromanganese in the production of steel castings, the bureau supplied the Sharon, Pa., plant of the company with 250 lb of manganese. Upon completion of these preliminary tests, two additional 500-lb shipments were furnished. All of the manganese used in the experiments was produced by the bureau-developed electrolytic method at the Boulder City., Nev., pilot plant.

Results of the study showed that electrolytic manganese could be used successfully in acid steel-foundry practice and that the addition of this material did not impair the quality of the steel or reduce the recovery of manganese. "In no case were the castings unsatisfactory, and the additional advantages of using manganese in pure form asserted themselves," the report states.

In describing the testing procedures, the report presents detailed information on slag analyses, manganese recoveries, tensile properties and gas evolution. Logs of the various tests are included in the 23-page publication. It was prepared by Frederick Sillers, Jr., Bureau metallurgist.

A free copy of the Report of Investigations 4482, "Electrolytic Manganese in Acid Steel Foundry Practice, Tests at National Malleable and Steel Castings Co., Sharon, Pa.," may be obtained by writing to the Publications Distribution Section of the Bureau of Mines, 4800 Forbes St., Pittsburgh 13, Pa.

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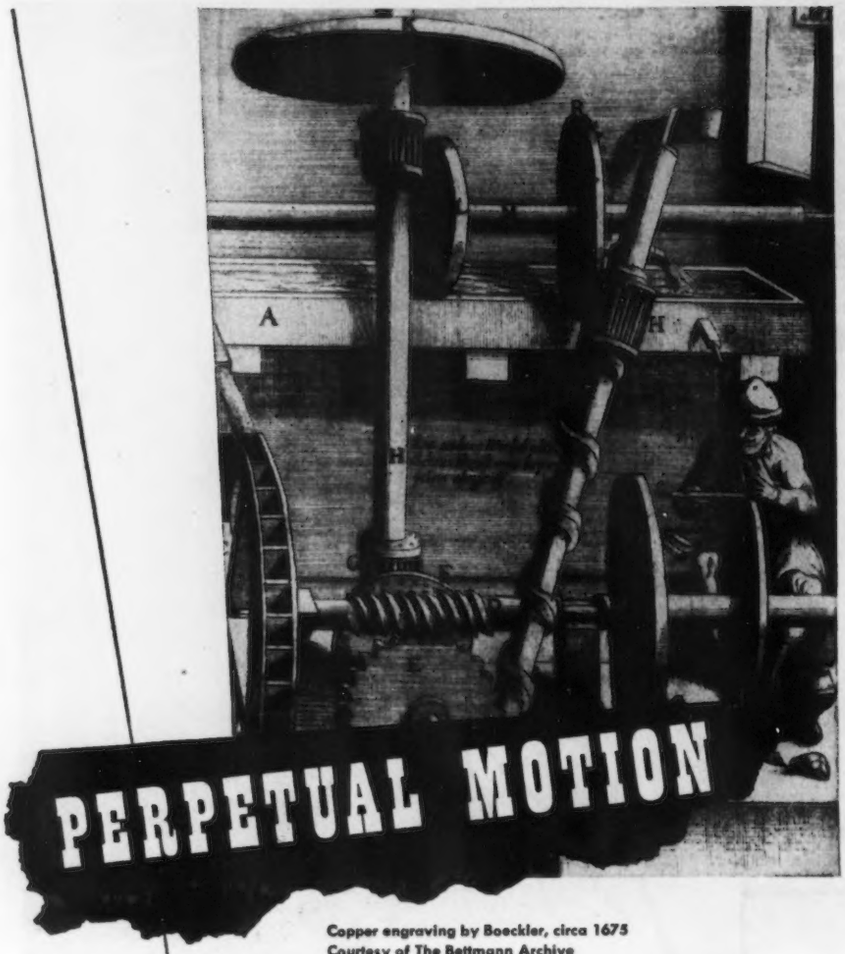

Copper engraving by Boeckler, circa 1675
Courtesy of The Bettmann Archive

This 17th Century grindshop was designed to be operated by a water mill that was supposed to produce perpetual motion

The advantages of perpetual motion—as well as the impossibility of achieving it—have long been apparent to those who are interested in problems of power transmission.

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Chicago Classifies And Measures Dust Deposited Over City

Chicago

• • • **Dirt and dust** is a popular subject here today. It is not popular because it is wanted but rather because the Chicago Dust Abatement Dept. is doing a mass job of collecting dust and dirt and analyzing it. The analytical department of the Armour Research Foundation of Illinois Institute measures and classifies dust collected at the 25 collecting stations placed strategically over the entire city.

Interesting data collected so far indicates Chicago is only half as dusty in summer as it is in winter. Also, the amount of dustfall in the city varies inversely with temperature. Foundation technologists report that a month of extremely high dustfall is invariably a windy month as a cold wind not only makes it more difficult to heat a building but also agitates the dust from the ground into the air.

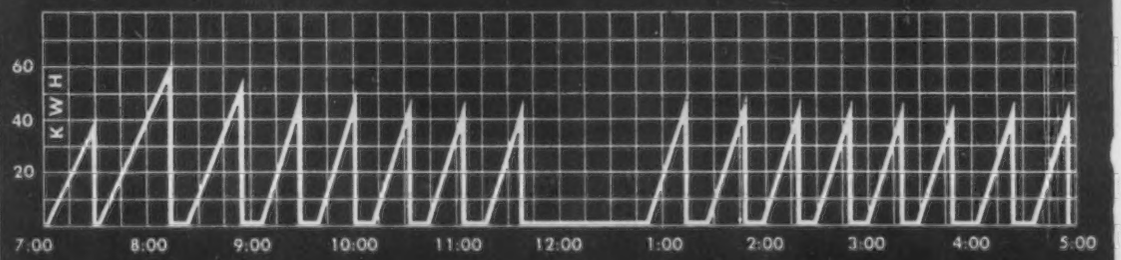
An average of 340.78 tons of dust per square mile fell on the city during the first 5 months of this year. The 1948 average was 699.55 tons per square mile. The March average for the entire loop area this year was 302.78 tons of dust per square mile.

The dust and dirt is collected in circular glass battery jars 6 in. in diam. To prevent trapped dust from blowing away, the jars are partially filled with liquid, the amount and nature of the liquid varying with the season. In winter they use an antifreeze solution. The jars are placed on the tops of four-story buildings whenever possible and the jars are not molested and will collect the actual dustfall rather than the transfer of dust close to the ground level.

When exposed jars are returned to the laboratory the liquid is measured, insoluble dust is filtered out and the total soluble dust in solution is determined. Insoluble dust is analyzed further to determine what portions are tarlike substances, which part is carbon, and what is noncombustible inorganic material.

Considerably more than 50 pct of the dust captured in the loop

DETROIT ROCKING ELECTRIC FURNACE



LFC—Brass

INSTALLATION—Three type LFC, 125 KW, 350 lb. nominal cold charge capacity Detroit Electric Furnaces in a Minnesota plumbing goods manufacturing company. Equipped with automatic rocking and electrode control.

OPERATION— Melt 350 lb. heats of 78% Cu, 13% Zn, 6½% Pb, 2½% Sn, and tapped into 400 lb. crucible. Operate 16 hours per day.

COSTS— 1947 Average
Power 273 KWH/Ton—$3.53 • Electrodes, 410 lbs. bronze/lb. electrode—$ .66
Refractory, 5000 heats/lining—$ .72 • Melt loss, ¾% @ 17c/lb.—$2.60

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All-electric operation saves handling and storing of messy, bulky fuels. Indirect arc eliminates costly carbon pick-up. The arc, established clear of molten bath at all times, assures uniform melting chamber temperatures and is automatically maintained at optimum power input.

On receipt of your production data, our engineers will furnish you with complete facts on the greater economy, constant and higher quality control, and faster output you achieve with Detroit Rocking Electric Furnaces which meet your most exacting requirements. Detroit Electric Furnaces for melting ferrous or non-ferrous metals are available in 10 to 4,000 lb. capacities, with conical or cylindrical melting chambers. For complete details, write today, to

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DETROIT ELECTRIC FURNACE DIVISION
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They come to us because they have learned that *Strenes Metal* cast dies greatly reduce finishing cost. Experience has shown them also that *Strenes Metal* dies deliver an extraordinary number of stampings between redressings, thereby effecting large savings in production and maintenance costs.

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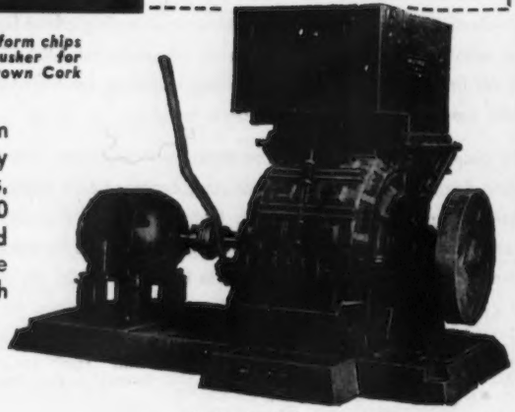
Segregated turnings are reduced to uniform chips by an American Shredder Ring Crusher for highest cutting oil recovery at the Crown Cork and Seal Co., Baltimore.

The cutting oil reclamation from chips produced from long, curly turnings of steel, alloys, brass, aluminum, etc., increases to 30 to 50 gallons per ton. This yield *plus* the savings in storage space and handling along with higher scrap value of short shovel chips pays for an American Turnings Crusher.



Write for information bulletin reducing your turnings with an American.

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during the winter months is noncombustible. This dust is composed largely of fly ash and inorganic minerals from the soil, such as sand and various silicates. At other stations in outlying sections of the city, a great per cent of the dust is soluble matter. When the laboratories report to the city dust abatement department, they do not break down the analysis on the soluble material.

New Glass-Lined Silo Changes Crop Storage Techniques for Farmer

Milwaukee

• • • **Glass-lined** air tight silos which may change crop storage techniques are now ready for the market. A. O. Smith Corp. here has been developing the silo for the past 4 years. Production schedules for this year consist of about 100 of these silos with a storage capacity of 140 tons.

The silos are shipped in circular sections and are bolted together when assembled on the site. Both inside and outside of the steel sheets are coated with a blue glass similar to a vitreous enamel. This is the same process that A. O. Smith uses to coat the inside of their hot water gas heater tanks.

Along with the silo itself, Smith engineers have developed an unloader which is driven by an external power source and unloads the silo from the bottom. This unloader travels in a circle around the bottom of the concrete pit which serves as a foundation for the silo. Because the silo is air tight it is believed possible with this silo to store alfalfa which, when unloaded, will still be fresh. All told the company has 50 steel silos installed on an experimental basis, some of which were erected in 1945. When the erection crews are trained, Smith hopes to get into mass production of the item.

The silos are 40 ft high and 14 ft in diam and are built out of nine sections of sheets about ⅜ in. thick. Since the silo is loaded as well as unloaded from the bottom, it represents a drastic change in silage storage technique. Selling price is approximated at about $2,000 with another $900 extra for the mechanical loader and unloader.

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We know from experience all the difficulties on the road to the top. And we fully realize that this process of industrial growth, from acorn to oak, must continue if we and all enterprise are to prosper.

Therefore, we at Doehler-Jarvis are constantly on the look-out for little "acorn" companies which need help to grow. We can be of great assistance to them with our die casting process to eliminate heavy investments and, at the same time, reduce costs by converting from more complex and expensive methods.

Having already helped many of our smaller customers prosper and grow, we are anxious to help others the same way.

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GM Reports Record Production for June

Detroit

• • • **June** was the biggest production month in the history of General Motors Corp.

Boosting its May output record by more than 10,000 units, General Motors produced 275,703 passenger cars and trucks in U. S. and Canada. This is the highest monthly output in its entire history.

Chevrolet turned out 116,615 passenger cars compared with only 57,517 a year ago. Chevrolet also exceeded its 1948 truck production by more than 4000 units.

Pontiac output was up from 17,915 a year ago to 33,298. Oldsmobile jumped from 15,160 to 27,432. Buick increased from 20,030 to 36,891 during June 1949.

Output of the GM truck plant as well as GM of Canada was also increased compared with the 1948 schedules.

For 6 months through June 1949, GM assembled 1,363,038 cars and trucks compared with 1,062,359 a year ago.

Non-Farm Workers Drop In Middle Atlantic States

New York

• • • **Continued cutbacks** in manufacturing in the Middle Atlantic States caused non-farm employment to fall during the month ending in mid-May, according to reports of the U. S. Bureau of Labor Statistics.

Total non-farm workers in New York, Pennsylvania, and New Jersey numbered 10,424,000 at mid-May—a decline of 0.6 pct from the previous month. Robert R. Behlow, Regional Director for the Bureau in New York, pointed out that while the number of manufacturing workers in the three states declined 85.4 thousand during the month, non-manufacturing employment gained 24.1 thousand—thus reducing the net loss of non-farm workers to 61,300.

There were 15,500 fewer jobs in industry, commerce, and government in New York State. Factory workers decreased by 36,200 with over half of this loss in the apparel industry. Job gains in construction, transportation and service industries amounted to 20,700.

In Pennsylvania, there were

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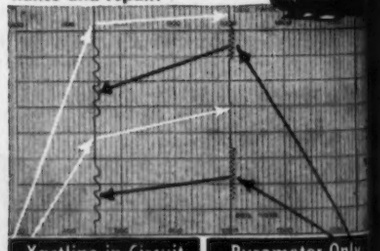
For XACTLINE, operating in the thermocouple circuit, ANTICIPATES the most minute heat variations on both heating and cooling cycles, thereby enabling your pyrometer controller to control far more closely than otherwise possible.

This *Anticipation Factor* means that XACTLINE causes the conventional pyrometer controller to respond to a millivoltage impulse up to 90% less than that normally required (the controlling pyrometer functions *only* when the desired temperature range has already been exceeded).

XACTLINE is laboratory tested and adjusted . . . does not require readjustment or coordination with other controllers.

NO gears, cams, shafts, bearings or other rotating or sliding parts. Simple design eliminates usual maintenance and repair.



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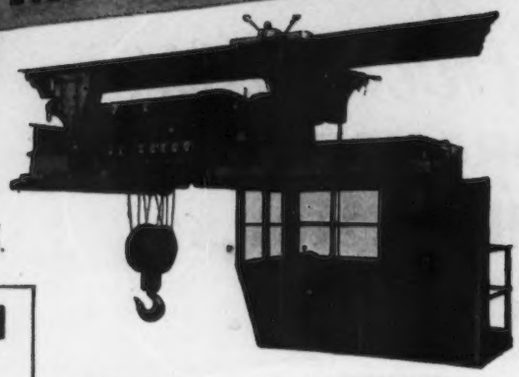

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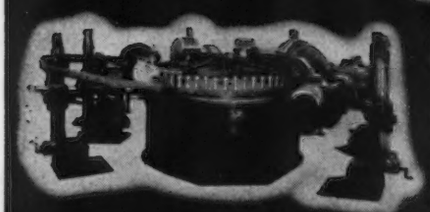
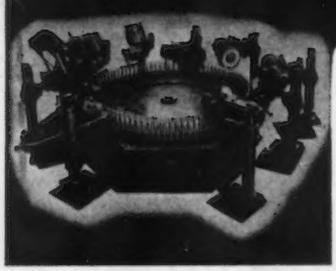
ACME CONTINUOUS ROTARY Automatics





for Better, Lower Cost Polishing and Buffing

• *At Left:* ACME 6-ft. Continuous Rotary having—50 continuous revolving chuck spindles—1 polishing and 5 buffing heads, used for finishing octagon plumbing goods escutcheons.

• *At Left:* ACME 10-ft.—Continuous Rotary—96 continuous revolving spindles—used with 2 ACME type G-3 Universal polishing belt heads with floating back up wheel and 8 ACME type G-3 buffing lathes—used for polishing and buffing brass door knobs.

ACME *Continuous Rotaries are built in various table sizes from 20 inches to 10 feet or more in diameter. They are adaptable to a great many arrangements that keep finishing costs down on polishing and buffing operations.*

SPECIAL MACHINERY AUTOMATIC BUFFING MACHINES

ACME Manufacturing Co.

1645 HOWARD ST. DETROIT 16, MICH.

Builders OF AUTOMATIC POLISHING AND BUFFING MACHINES FOR OVER 35 YEARS

32,200 fewer jobs in all fields of employment except agriculture. Manufacturing declined by 34.2 thousand workers with the main loss in iron and steel industries. Construction and interstate railroads gained two thousand workers to produce a slight offset.

New Jersey also showed a proportionately big loss of 13,600 non-farm workers. Factory jobs, especially in the machinery and apparel industries, fell by 15 thousand, while there was only a slightly offsetting gain of 1400 in interstate railroads.

Produces Rubber-Lined Pipe

Midland, Mich.

• • • **Large size** steel pipe and fittings lined with Saran Rubber 187 are now being produced by the Michigan Pipe Co., Bay City, Mich., according to a recent announcement by Dow Chemical Co.

The larger pipe sizes will complement the line of smaller pipe manufactured by Dow and distributed through the Saran Lined Pipe Co. of Detroit.

Saran lined pipe is resistant to abrasion and is employed as an inert lining material in contact with petroleum products, chlorinated hydrocarbons, bleaching acids, and most chemicals.

The standard rubber lining is ⅛ in. thick. Operating range is from —5°F to 167°F, depending on the service conditions.

Michigan Pipe Co. is an established producer of wood pipe and wood-lined steel pipe.

Safety Assn. Holds Meeting

New York

• • • **Lawrence E. Dickson,** president of Standard Safety Equipment Co. of Chicago, was elected president of Industrial Safety Equipment Assn. for the second consecutive year at the association's annual meeting last month at Shawnee-on-Delaware, Pa.

Charles H. Gallaway, sales manager of American Optical Co.'s Safety Products Div., was elected vice-president of the association, succeeding Walter G. Legge. During the past year, Mr. Gallaway served as a member of the planning committee. William J. Parker of William J. Parker, Inc., New York, was elected secretary-treasurer of the association.

...ONE OF FOOTE BROS. COMPLETE LINE!

Hygrade enclosed gear drives

This famous line of worm gear drives has been newly engineered to offer the maximum in heavy-duty service and rugged dependability. These units now possess greater overhung load capacities.

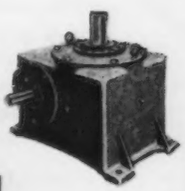
Advanced methods in manufacture make possible new refinements in both worm and gear which assure extreme precision in the development of mating surfaces with a flawless finish. This gives longer life, smoother operation, quieter service.

Hygrade Drives are available in both horizontal and vertical types. Single reduction ratios up to 71 to 1, capacities up to 125 h.p. Double reduction (helical-worm and double-worm) with ratios from 50 to 1 up to approximately 4000 to 1, capacities up to 50 h.p.

AVAILABLE FROM STOCK

Foote Bros. Hygrade Drives in more popular sizes and ratios are available from stock. Write for information.

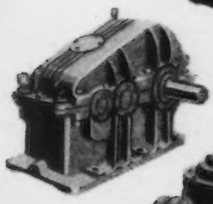
Hygrade Horizontal Drive



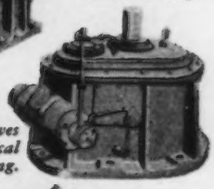
Hygrade Vertical Drives.

Hypower Drives bring new compactness in design, lower original cost, lower operating cost, through increased thermal capacity.

Hygrade Top Hat Drives have wider bearing span in the unit, permitting greater unsupported loads.



Maxi-Power Helical Gear Drives, available in single, double and triple reductions.



Agitator Drives combining helical and worm gearing.

Straight Line Drives. Designed for long life and quiet operation. Large overhung load capacities.

FOOTE BROS.

Better Power Transmission Through Better Gears

FOOTE BROS. GEAR AND MACHINE CORPORATION
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Foote Bros. Gear and Machine Corporation
Dept. M. 4545 South Western Boulevard
Chicago 9, Illinois

Gentlemen:
Please send me information on drives checked below.

- ☐ Hygrade Enclosed Worm Gear Drives
- ☐ Hypower Enclosed Worm Gear Drives
- ☐ Maxi-Power Enclosed Helical Gear Drives
- ☐ Agitator Drives
- ☐ Straight Line Enclosed Gear Drives

toughen metal

improve surface

end stock waste

with

TORRINGTON SWAGERS

The Torrington Rotary Swaging Machine delivers 4000 hammer blows a minute...reduces, sizes, rounds, points and tapers rod, wire and tubing... work-hardens metal for toughness and resilience...produces a burnished surface... utilizes every bit of stock.

Torrington Swager performance is based on our 42 years of swaging experience. Send the coupon for your free copy of the booklet illustrating the machines and describing the art of rotary swaging.

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For a free copy of this booklet, send the coupon today.

Please send a copy of "The Torrington Swaging Machine" to:

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Will Build Large Radar Antenna for U.S. Navy

Cedar Rapids, Iowa

• • • **A 50 ft diam** parabolic radar antenna will be built for the U. S. Navy Research Laboratory, Anacostia, Md., by Collins Radio Co. of Cedar Rapids. The antenna will consist of 28 sand cast sections, each weighing about 1 ton. The castings will be made by the Aluminum Co. of America at Cleveland.

The antenna will be used in the field of radio research to study the effects of activity of the sun on long distance radio communication. Patterns for the castings will be completed in September, and delivery of the unit is scheduled for the fall of 1950. After the 28 sections making up the antenna have been completed, they will be assembled and the entire antenna will be machined as one unit. Most of the work will be done in a large circus tent, since no room in the Collins plant is sufficiently large to accommodate the sections.

200 Miles of Texas Pipe Line in Ground

Owensboro, Ky.

• • • **Texas Gas Transmission** Corp. announced recently that construction crews working on its 800-mile Texas-to-Ohio natural gas pipe line have put approximately 200 miles of pipe in the ground, and are working on schedule on the 26-in. pipe line project.

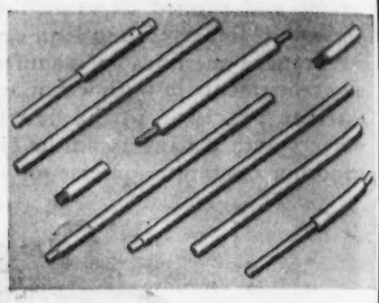
W. T. Stevenson, executive vice-president of the company, declared that Texas Gas expects to have the pipe line in preliminary operation by the end of the year, in time to deliver natural gas supplies to meet the winter's cold weather. Work along most of the pipe line route began 2½ months ago.

After completion of the new pipe line, it was pointed out, the Texas Gas system will include 2366 miles of pipe line, compared with the present 1501 miles. Annual sales are expected to reach approximately 150 billion cu ft, an increase of 100 billion cu ft a year over present sales. Compressor stations along the pipe line system will number 17, as against the eight stations now in operation. The installed compressor hp

PAY LESS

for precision metal parts made by

TORRINGTON



Low cost for precision quality, fine finish, uniform heat treatment is assured by our high productive capacity and special equipment.

Typical of a wide variety of parts are special rollers, shafts, studs, dowel pins made to order. Chamfer, radius, taper, hemispherical and other styles of ends. Rollers from .014" to .500" diameter. Centerless ground .040" to .500"; diameter tolerance ±.0001". Finish as fine as 3 micro-inches. Dowel pins from .0625" to .3125".

Send your prints and specifications today for prompt quotation and ask for a copy of "Precision Metal Parts."

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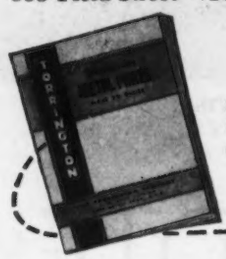

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To Cut Costs... Don't Skimp on Weld-Planning

By Michael Senek, Vice President
Falls Welding & Manufacturing Co., Newton Falls, Ohio

Michael Senek

Starting out as a small job welding shop, we have built a good reputation throughout the Middle West as fabricators of earth-moving equipment parts. Much of our success is due to the extreme care we take in preliminary planning of jobs and in tooling up for close tolerances and high-speed welding. It pays off in lower costs and top quality.

We consider it important to do these things when we tackle a new job:

1. Analyze the design. Suggest design changes to the customer if they will simplify tooling-up or speed up welding, without affecting operation of part.

2. Tool-up for down-hand welding. We design and build our own fixtures to hold parts in accurate fit-up and permit positioning for speedy, down-hand welding with large electrodes.

3. Call in Lincoln Engineer. We find it valuable to have his suggestions on the design, the fixtures and the welding procedure—type and size of electrode and welding current.

Needless to say, we are rabid fans for the Lincoln team—its Engineering Service, Welders and "Fleetweld" Electrodes.

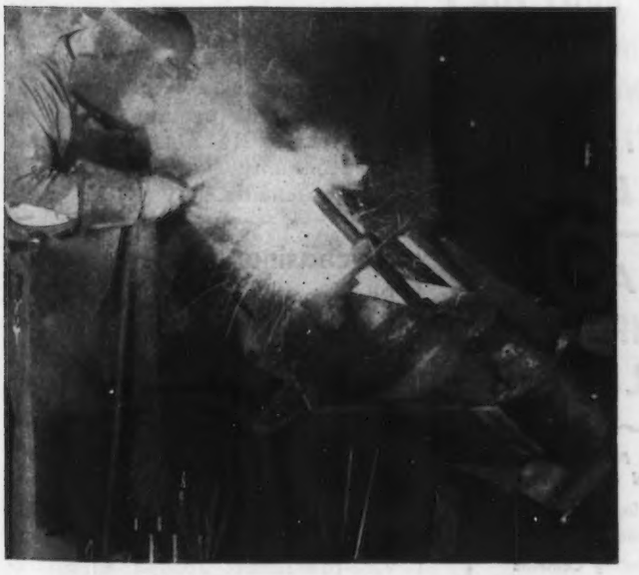


Fig. 1. Finish welding boom for loading machine. Fixture can be rotated to any angle for downhand welding. Uses 400-amp. "Shield-Arc" Welder with ¼" "Fleetweld 5" Electrode at 300 amps.

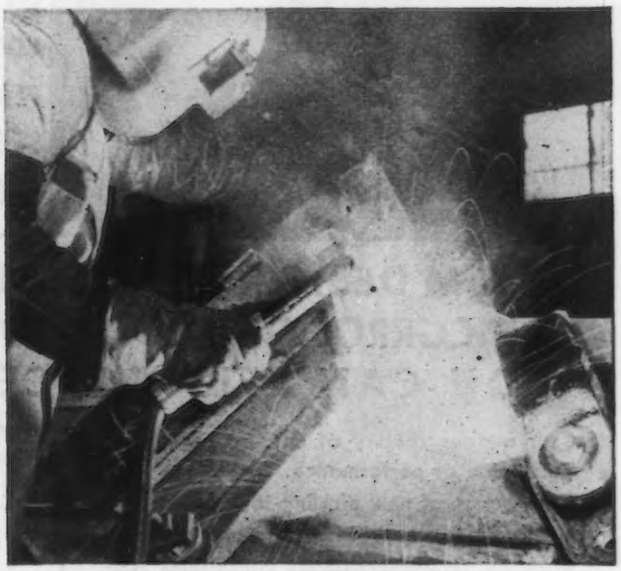
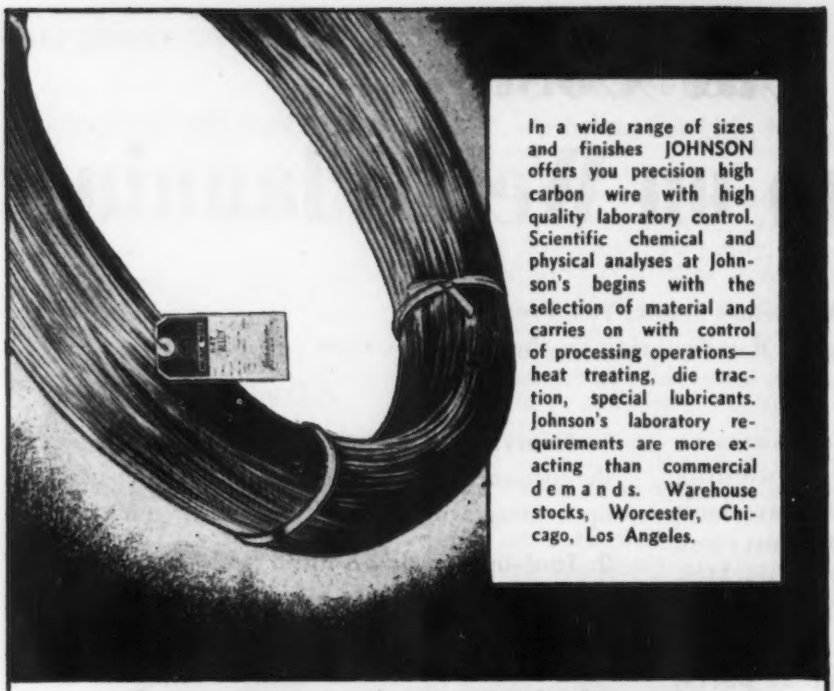


Fig. 2. Finish welding of hydraulic tank for loading machine in positioning fixture. Many joints are boxed into corners, making arc blow severe. Welded with 500-amp. "Fleetwelder" and 5/16" "Fleetweld 7" at 400 amps.

The above is published by **THE LINCOLN ELECTRIC COMPANY** *in the interests of progress.*
Write for free Mild Steel Weldirectory. The Lincoln Electric Company, Dept. 58, Cleveland 1, Ohio..



In a wide range of sizes and finishes JOHNSON offers you precision high carbon wire with high quality laboratory control. Scientific chemical and physical analyses at Johnson's begins with the selection of material and carries on with control of processing operations—heat treating, die traction, special lubricants. Johnson's laboratory requirements are more exacting than commercial demands. Warehouse stocks, Worcester, Chicago, Los Angeles.

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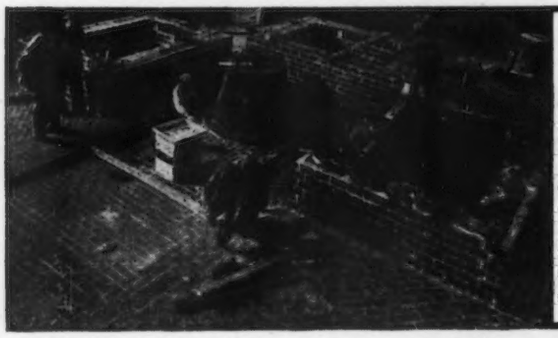

THESE ACID TANKS WERE BUILT FOR CONTINUOUS MAINTENANCE—FREE SERVICE BY CEILCOTE

FROM DESIGN TO INSTALLATION OF CORROSION-PROOF EQUIPMENT YOU CAN RELY ON CEILCOTE

Our quarter century of experience is your guarantee of performance. When you plan construction of new pickling tanks, neutralizing tanks, floors, process tanks or fume ducts write for recommendations concerning your specific operating conditions. Representatives in most principal cities.

Ceilcote Products include acid and alkali proof —
- Linings
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CEILCOTE *Corrosion Proof*
MATERIALS • CONSTRUCTION • SUPERVISION

The CEILCOTE *Company* ROCKEFELLER BUILDING • CLEVELAND 13, OHIO

will total 97,915, compared to the present total of 29,115 hp.

The initial capacity of the new pipe line at the end of this year is expected to reach 304 million cu ft of gas a day. By the spring of 1950, upon the completion of additional facilities, the capacity of the 26-in. line will reach 400 million cu ft a day, bringing the total daily delivery capacity to about 650 million cu ft a day.

Supplies from the new pipe line will be distributed to Texas Gas' existing customers in Louisiana, Arkansas, Mississippi, Tennessee, Kentucky, Indiana and Illinois, as well as to major distributing utilities in Ohio, Pennsylvania and other points.

Deere Doubles Profit

Moline, Ill.

• • • **Deere & Co.** reported in their semiannual statement for the last 6 months ending Apr. 30, the company had shown increased profits. Earnings reached $16,435,014 or $5.11 a common share for that period compared to $2.52 a share for the like period in 1948. Sales rose to $187,760,847 from the previous figure of $140,060,707.

Charles D. Wiman, president, told the shareholders increased costs will be incurred during the coming months as new labor contracts have just been completed on the basis of a 5¢ general wage increase and certain other adjustments. He also added that the company had enlarged employee benefits.

Purchasing Agents Elect

Buffalo

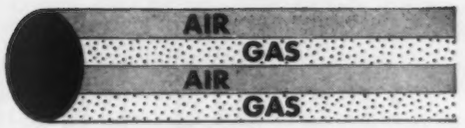
• • • **The Purchasing Agents** Assn. of Buffalo elected John C. Pfisterer of the Mathieson Chemical Corp., Niagara Falls, as president. Other officers chosen at the annual meeting were:

Harry D. Grow, Bethlehem Steel Co., first vice-president; Ernest Bursch, Bos-Hatten, Inc., second vice-president; Joseph K. Silvernail, Socony-Vacuum Oil Co., secretary, and George A. Munger, Ford Motor Co., treasurer.

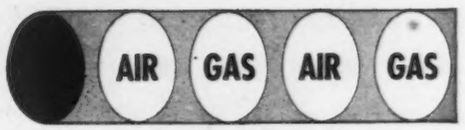
Edward Kidd, Worthington Pump & Machinery Corp., was elected a director, and Chester M. Bell, Durez Plastics & Chemicals Inc., retiring president, was elected a national director.

Layers and Lumps make Heating expensive!

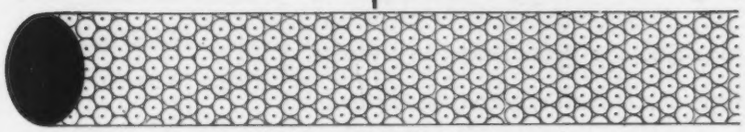
SOME HAVE IT THIS WAY....



SOME HAVE IT THAT WAY....



MANY HAVE IT KEMP-WAY!



View of gas pressure governor, part of air inlet and air check valve, mixing chamber and turbo-compressor.

Kemp Carburetion makes no layers, no lumps . . . gives you a steady flow of completely premixed and completely combustible fuel.

You get *perfect* combustion and uniform heat . . . through the space, the chamber, or the metal.

You keep costs *down*, and efficiency *up* . . . to a level which frequently enables Kemp installations to pay for themselves in two years or less.

Needless to say, there are problems involved in buying equipment to save money. That's why we have qualified engineers who are prepared to answer your questions about what Kemp equipment can do to save you money. A Kemp representative is not far from you. Send the coupon if you'd like to see one . . . or send for our Bulletin IC-22 on Kemp Industrial Carburetors.

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The C. M. Kemp Manufacturing Co.
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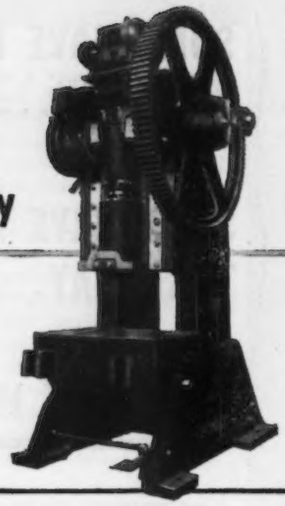
11A-7

Meet

THE BIG BRUTE

.... the press for heavy duty



The Thomas 8A Back-Geared Press is the Big Brute of the Thomas O.B.I. line. Its extremely rigid construction, with plenty of weight where weight is needed makes it the ideal heavy duty machine for producing the heavier type of stampings, *with greater accuracy* and *less die wear.*

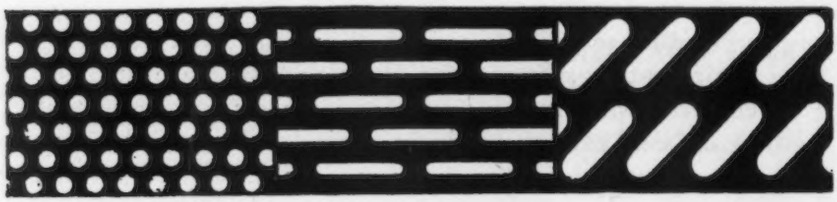
MODEL 8A

- *Rated Capacity, 106 tons*
- *Shut Height, 18"*
- *Bolster Area, 30" by 42"*
- *25,000 lbs. of useful weight*

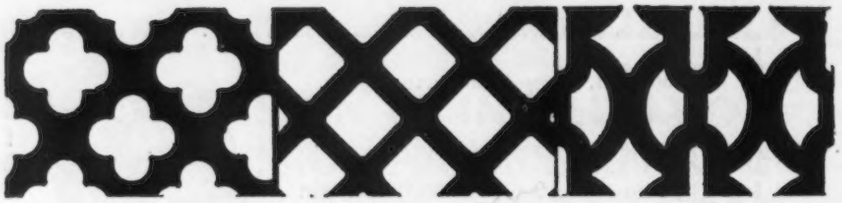
THOMAS
MACHINE MANUFACTURING COMPANY
PITTSBURGH, 23 PA.

Write for Bulletin 212A

P-5 **PUNCHES • SHEARS • PRESSES • BENDERS • SPACING TABLES**



For whatever purpose you need perforated metal



Hendrick will fabricate it to your specifications * * * from any commercially rolled metal * * * in any gauge * * * with any shape or size of openings. Extensive plant facilities, an unsurpassed stock of dies and tools, and more than 70 years' experience in perforating metals, are at your service.

Write us regarding your specific requirements.

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Architectural Grilles
Mitco Open Steel Flooring,
"Shur-Site" Treads and Armorgrids

Canada Lifts Export Controls from Some Iron, Steel Products

Ottawa

• • • **Canada has lifted** export controls from a wide list of iron and steel products, the Trade Dept. announced. This means that such goods as automobile parts, electrical appliances, railway rolling stock and lead are in easier supply in the domestic markets and can be shipped out of the country without an export permit.

Following is the new list issued by the Trade Dept., on which export controls have been eliminated:

Machinery and parts for dairy and laundry or dry cleaning equipment, new, used or rebuilt machinery or machine tools.

Automobiles and automotive equipment as follows: Automobiles, excavating and power shovels, motor graders, motor trucks and busses, tractors and equipment.

Electrical appliances such as ranges, rangettes, refrigerators, washing machines.

Manufactured products: Bottle closures, chains, enamelware, furniture, for household or business use, hand tools, agricultural tools, hollowware, flatware, utensils and containers, hydraulic pumps, springs for furniture or mattresses, tinplate, containers, valves, welding rods and wire, wheelbarrows, wire cloth, wire manufactures.

Railway rolling stock and equipment of all kinds, complete or unassembled.

Hoisting equipment as follows: Cranes, derricks, hoists, freight or passenger elevators.

Lead in the form of bullion, lead base bullion, antimonial lead, alloys castings, pigs, bars, reclaimed lead, dross lead, dross or scrap, including antimonial lead scrap.

Joins Armour Research

Chicago

• • • **Dr. Edward F. Degering** has been named assistant chairman of chemistry and chemical engineering research at Armour Research Foundation of Illinois Institute of Technology, Chicago.

Contact KAYDON of Muskegon

FOR ALL TYPES OF BALL AND ROLLER BEARINGS 4" BORE TO 120" OUTSIDE DIAMETER.

KAYDON JOURNAL ROLLER BEARINGS

3.375" x 5.000" x 2.000" ON YODER ROLL FORMING MACHINES

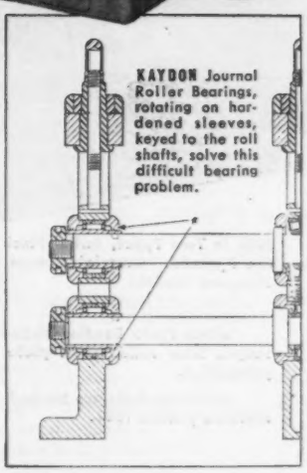
Smooth rolling for Yoder Roll Formers

IT'S a rugged business these Yoder Roll Forming Machines are in! They take flat, heavy gauge metal strips and form them into modern moldings, tubular and angular shapes. Under the terrific loads required in the forming operations, roll shafts must operate smoothly. This calls for precision bearings of extreme ruggedness. Husky **KAYDON** Journal Roller Bearings meet these requirements.

In many types of heavy-duty machinery for metal working industries, steel mills, paper mills . . . heavy oil-field and construction machinery, and similar equipment, **KAYDON** is helping engineers to improve performance thru advanced bearing applications.

* * *

Counsel in confidence with **KAYDON**. Capacity now available for all sizes and types of **KAYDON** bearings . . . and for atmospheric controlled heat treating, precision heat treating, salt-bath and sub-zero conditioning and treatment, microscopy, physical testing and metallurgical laboratory services.



KAYDON Journal Roller Bearings, rotating on hardened sleeves, keyed to the roll shafts, solve this difficult bearing problem.

KAYDON *Types of Standard or Special Bearings:*

Spherical Roller • Taper Roller
Ball Radial • Ball Thrust
Roller Radial • Roller Thrust

THE KAYDON ENGINEERING CORP.

MUSKEGON • MICHIGAN

English Building Industry Team Will Study American Construction Procedures

Washington

• • • **A 17-man team** from Great Britain's building industry will arrive in the United States on July 21 to start a 6-weeks' study of American construction methods. The team, which includes architects, contractors, surveyors and workers, is the fifth sponsored by the Anglo-American Council on Productivity in cooperation with ECA's Technical Assistance Div.

While in the United States, the team will study American methods of constructing low and medium-cost houses, small schools, industrial plants and commercial office buildings of a size comparable to those in Great Britain. The group is particularly interested in methods of utilizing building materials other than lumber in the construction of houses.

The team also will observe methods of design, cost and procedures, the manner in which owner, architect, engineer, contractor and laborer cooperate to expedite housing, labor relations and financing arrangements.

The itinerary for the tour will be announced at a later date.

Members of the supervisory group are: Representatives of the National Federation of Building Trade Employers — Robert Owen Lloyd, Lloyd & Cross, Ltd., Birkenhead; Charles Douglas Calverly, George Calverly & Sons, Ltd., Leicester; Wilfred Horsfall, George Horsfall & Son, Liversedge, Yorks; Noel Stanley Farrow, Howard Farrow, Ltd., London.

Representatives of the Scottish National Building Trades' Federation (Employers)—Robert Stirton Gray, Charles Gray (Builders) Ltd., Coldside, Dundee.

Representatives of the Federation of Associations of Specialists and Sub-Contractors—Walter Robert Cowen, Walter Cowen, Ltd., Brook Green.

Members of the technicians' group are:

Michael T. Waterhouse, architect, Waterhouse & Ripley, London; Robert Hogg Matthew, architect to the London County Council, London; Thomas Hill, quantity surveyor, J. P. Allen & Hill, Newcastle-on-Tyne; Montagu Hamilton Thackray, quantity surveyor, Franklin & Andrews, London.

The workers' group is composed of the following: James Patrick Bates, plumber, G. H. Haden, Ltd., London; Francis William Beazley, industrial adviser, National Federation of Building Trades Operatives, Clapham; William James Clarke, plasterer, Lowe Son & Heyes, Ltd., Bolton, Lancashire; William Robert Johnstone, carpenter and joiner, Dove Bros., Ltd., Islington; Glynn Lloyd, painter and decorator, Neath Rural District Council, Neath, Wales; John Hutton McKechnie, clerk of works and bricklayer, Burgh of Motherwell & Wishaw Town Hall, Motherwell.

The team secretary is Charles Rowlands, secretary of the National Federation of Building Trades Employers, London.

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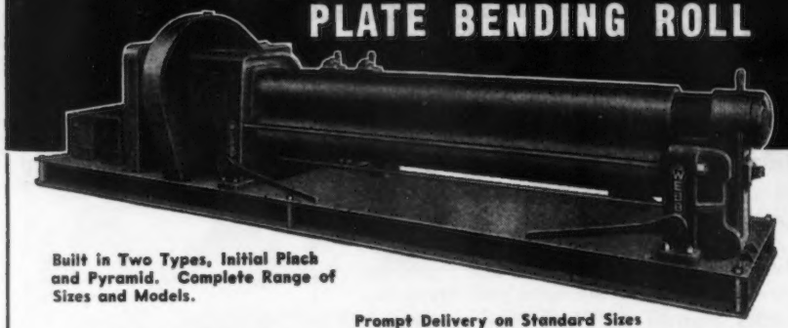

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Iron, Steel Exports Up During April; Tin Plate Leads Items

Washington

• • • **Exports of iron** and steel continued to increase during April, according to a new report of the Commerce Dept. and American Iron & Steel Institute. The month's total was 522,546 net tons.

In addition, U. S. exporters shipped another 36,961 tons of scrap to foreign ports during the month.

Total tonnages exported during the first 4 months of 1949 stand at 1,769,009 tons of iron and steel products and 86,838 tons of scrap.

Exports of tin plate continued to top all other iron and steel products in volume. A total of 59,392 net tons of tin plate was exported. Other products exported in large tonnages were non-

fabricated plates, 48,758 tons; black steel sheets, 54,617 tons, and ingots, blooms, billets, slabs and sheet bars, 32,048 tons.

Total export figures for April and for the first 4 months of 1949 are:

	April 1949	First 4 Months 1949
Semifinished and Finished Products:		
Ingots, blooms, billets, slabs, sheet bars	32,048	83,527
Wire rods	4,169	12,393
Skelp	11,345	31,768
Iron bars	257	736
Concrete reinforcement bars	10,735	38,407
Steel bars, cold-finished	4,174	14,550
Other steel bars (excluding alloy)	25,566	108,141
Alloy steel bars	3,207	10,030
Welding rods, electric	2,230	7,029
Plates including boiler, not fab.	48,758	132,281
Plates, fab., punched or shaped	2,540	11,180
Iron sheets, black	1,221	6,775
Steel sheets, black	54,617	177,067
Galvanized sheets	6,644	25,579
Strip steel, cold-rolled	6,289	24,289
Strip sheel, hot-rolled	7,577	30,638
Tin plate	59,392	210,596
Terne plate	754	5,184
Structural shapes, plain	31,168	102,032
Structural shapes, fab.	12,245	60,202
Frames and sashes	352	1,180
Sheet piling	1,256	6,384
Rails, 60 lb per yd and over	23,432	81,649
Rails, less than 60 lb per yd	651	3,605
Rails, relaying	1,898	6,783
Splice bars and tie plates	3,565	9,116
Frogs and switches	479	3,540
Railroad spikes	671	1,386
Railroad bolts, nuts, and washers	272	722
Car and locomotive wheels, tires and axles	4,447	15,470
Seamless black pipe and tubes	2,780	10,354
Seamless casing and line pipe	24,684	100,015
Seamless boiler tubes	3,528	15,797
Welded black pipe	11,986	34,973
Welded galvanized pipe	6,124	26,404
Welded casing and line pipe	29,794	63,188
Welded boiler tubes	264	1,432
Other pipe and fittings	6,911	24,955
Plain wire	5,979	31,643
Galvanized wire	6,564	22,197
Barbed wire	4,841	19,309
Woven wire fencing	1,439	6,085
Woven wire screen cloth	330	1,921
Wire rope and strand	1,306	5,166
Wire nails	1,896	7,506
Other wire and manufactures	2,032	9,262
Tacks	163	768
Other nails, incl, staples and horseshoe nails	804	3,335
Bolts, nuts, rivets and washers, except railroad	2,791	11,771
Forgings	3,151	9,968
Horseshoes	40	92
Total	479,366	1,628,880
Other Finished Products:		
Tanks, complete and knocked down	14,145	47,319
Metal lath	867	3,242
Tin and galvanized hollow ware	222	1,109
Tin cans, finished or unfinished	2,954	15,596
Malleable iron screwed pipe fittings	619	2,295
Cast iron screwed pipe fittings	69	423
Cast iron pressure pipe and fittings	6,171	15,630
Cast iron soil pipe and fittings	960	2,934
Iron castings and ingot molds	4,686	17,747
Steel castings	310	857
Sprocket and other power transmission chains	434	1,827
Other chains	545	2,415
Total	31,982	111,394
Pig iron	9,781	17,682
Ferroalloys	1,417	11,053
Total	11,198	28,735
Grand Total	522,546	1,769,009
Iron and steel scrap	36,961	86,838

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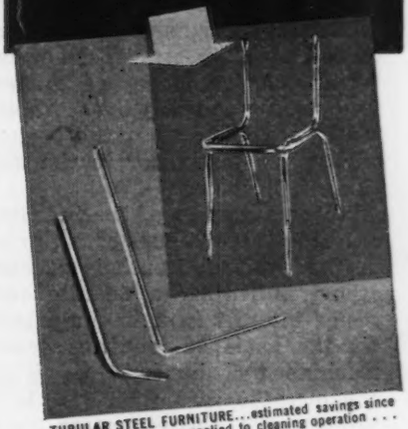

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MACHINE TOOLS

. . . News and Market Activities

Tool Market Weakened by Steel Truce, Threatened Wage Increase

• • • **Usually well-informed** sources in the machine tool industry predicted early this week that the 60-day truce in steel and the threat of a fourth round wage increase will weaken the machine tool market, which had been gradually sliding since March.

Preliminary reports indicate that new firm orders in June were down 15 pct from May levels; foreign orders and cancellations were about the same. Shipments are expected to be up about 10 pct, but the backlog of unfilled orders will be down about 10 pct.

Trade sources point out that prior to the present heightening of business uncertainty the machine tool industry was in the predicted summer slump. On the other hand, it is still in somewhat better position in regard to new firm orders, and no worse off generally, than it was at the bottom of 1947 or just prior to the machine tool show.

Major segments of the industry report that the volume of inquiries during the past month is encouraging, indicating a definite customer interest in new equipment. On the basis of inquiries, many machine tool buyers are giving considerable attention to high production single-purpose machines. However, many companies took care of the bulk of their

June Orders Off from May Levels With Foreign Orders, Cancellations Unchanged

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equipment requirements during the latter part of 1948 before capital reached its present scarcity and have been more or less out of the machine tool market this year. Some of this money was spent when firms could anticipate high 1948 profits and thus felt confident to go ahead.

But apart from inquiries, there were plenty of signs that the machine tool business, like business in general, might have some distance to go before reaching the turning point. In Cleveland, the Cleveland Trust Co.'s business bulletin pointed out that new orders placed with manufacturers have been declining since last fall. For the first quarter of 1949, the volume was 13 pct below the third quarter of 1948. Industrial production in May declined to a new low, according to the bulletin. It was, however, still 13.9 pct above normal in May. It was 20.1 pct in April and 26.7 pct in March.

In Detroit, word has been received during the past week that Chrysler's plans for a new engine have been shelved, temporarily at least. All engineering work by machine tool suppliers has been stopped, it is reported. Some sources have interpreted this to mean that Chrysler has decided to make a fresh start on a new engine program, presumably of the high compression type.

First quotations on the Dodge engine program were requested early in the year. Recently, according to informed trade sources, there were indications that a major decision might soon be made on this program.

There have been some recent placements on the Borg-Warner automatic transmission for Studebaker, it is reported, and this project appears to be gaining momentum. There are also hopeful signs that some tool and die shop tooling may be in the offing.

The Ford transmission program remains quiet, but some ordering on a Ford diecasting program has been reported. Details of the program have not been disclosed, however.

In Sidney, Ohio, Monarch Machine Tool Co. reported an increase in net profit for the second quarter. Jerome A. Raterman, president, reported net income of $162,700, equal to 77¢ a share, compared with $146,953 or 69¢ a share for the second quarter of 1948. Second quarter sales this year totaled $2,113,320 compared with $2,082,289 last year.

Mr. Raterman said Monarch's backlog and current orders point to a profitable third quarter.

"While purchasers of capital goods are cautious, nevertheless, there is an active interest in machine tools as a means of achieving immediate reductions in production costs. With competition growing keener in every manufacturing field, the possibilities of equipment that will increase output per wage dollar are being studied more closely than at any time since the war," Mr. Raterman pointed out.

Reveal Development of New Grinding Wheel

Cincinnati:

This week, the Cincinnati Milling Machine Co. announced the important research development of a new grinding wheel. Details of the development are disclosed in the current issue of the company's magazine, "*REPORT* from Cincinnati Milling Machine Co."

While the company has investigated and reported basic fundamentals in the study of metal cutting action, *REPORT* tells how this basic research, applied to various types of single point tools and milling cutters, can be used for the improvement of cutting action of the abrasive grain in grinding wheels.

The company's research engineers have strived to improve the performance of abrasive grains as cutting tools in grinding processes, and the efforts have included an exhaustive study of individual grains and their characteristics, along with many variable factors that affect the wheels themselves. It is said that results of the research include the ascertainment of desirable characteristics and a study of such factors as pressures, friction and heat, which are cumulative in their effect.

Further, it is claimed that performance records established under everyday operating conditions on all types and sizes of grinding jobs have indicated that the new wheels have characteristics for improved performance.

The new grinding wheels are produced in limited quantities only, and are not available for the market.

WHAT'S THE
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No SINGLE characteristic denotes the real difference between alloy steels and carbon steels.

Certain of the most useful mechanical properties—strength, hardness, toughness, ductility—can be developed to a high degree, individually *but not collectively* in carbon steels.

Nor can such desirable characteristics as response to mild quenching, high strength and elastic properties in large sections, and good resistance to distortion and cracking in heat treatment of complex shapes be developed in carbon steels.

In nickel alloy steels *all* of these characteristics can be obtained, in greater or lesser degree, *at the same time*. From among the many grades of standard alloy steels containing nickel it is possible to select one which provides the best set of properties for meeting virtually any reasonable requirements.

Yes, in the final analysis, it is the better, more complete *combination* of properties—and, therefore, better performance and long-range economy—available in the nickel alloy steels which constitutes the most significant difference.

We shall be glad to furnish counsel and data to help you select the right nickel alloy steel for your requirements.

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NONFERROUS METALS

. . . News and Market Activities

Strong Undertone Persists After Recent Price Increases

New York

• • • **The nonferrous** metals markets were somewhat stronger last week following the price increases in both copper and lead during the previous week. Lead advanced another ½¢ per lb on July 13 bringing the price to 14¢ per lb, New York. The zinc market showed the first signs of strength this week when it advanced ½¢ per lb on July 18, bringing the price to 9.50¢ per lb, East St. Louis. This was the first price increase for zinc since it started its decline in March.

The copper market was still firm this week following the 1⅝¢ per lb increase during the previous week. Consumers are confident that an adequate supply of copper will be available at the prevaling price of 17.625¢ per lb, Valley. Buying activity is expected to increase when the brass and wire mills re-enter the market after their vacation shutdowns.

The scrap market was easier this week. The price of No. 1 copper wire was down ½¢ per lb to 13.75¢. Price reductions were attributed to the increased offerings of scrap and to the reduced purchases of some large consumers. Brass mill scrap is up following the recent increase in the price of copper. Mill products were also advanced to the 17⅝¢ copper level.

Another source of encouragement in the copper market was the delivery of 45,653 tons to consumers in June, compared with a low of 32,566 tons in May. However, production of refined copper was off 6000 tons to 92,118 tons, compared with 98,139 tons for May. The refined stocks increased 38,484 tons to 166,925 tons at the end of June.

The lead market was the bright spot of the week. The demand for the metal at the 14¢ per lb level is still in excess of the tonnages that the producers are willing to sell. The government has also been buying some lead for its stockpile during the past week. Lead sales for the week have more than doubled. The lead scrap market is tight and available supplies are still limited. This week the smelting charge was raised to $45 a ton, whereas previously there was a range of $40 to $45.

Consumers' Demand for Lead Still Exceeds Tonnage Offered for Sale

° ° °

Zinc received a shot in the arm last week when President Truman's proposal for accepting a 60-day extension of the steel union contract was agreed upon by the major steel producers. Demand for the metal had improved during the past several weeks. The diecasters have been taking increased tonnages, and, with the galvanizers still in the market, a price rise was in order. Some producers had been reluctant to sell future deliveries to new customers at the old 9.00¢ East St. Louis price. Others had been limiting the tonnages to their regular customers.

Production of zinc for June was 74,054 tons, which is 3200 tons above the monthly average of 70,842 tons for 1948. Unfilled orders were off 16,000 tons from May to 42,700 tons at the end of June. Zinc stocks at the end of June reached 82,796 tons. This is the largest total since September 1947. However, included in this total is government owned zinc, to which it has not as yet taken title.

Effective July 12, Britain reduced the selling price of nonferrous metals. The new prices per pound delivered to consumer are: Copper, 18.72¢; lead, 13.59¢; and zinc, 10.44¢. With the increase in the price of lead on the American market, the Minister of Supply announced that effective July 14, the new price of lead would be 14.58¢ per lb. This week another price rise can be expected to be announced for zinc since the ½¢ increase on the American market.

The London Metal Exchange is not to be reopened for the time being. This was indicated in Parliament on July 11 by George Strauss, Minister of Supply, who said he was at present unable to agree to dealings in copper, lead and zinc. He stated that he had carefully considered commercial and industrial representations on the advantages of reopening the Exchange, in particular the hedging facilities which this would provide.

In support of his decision he maintained that a free market in nonferrous metals would have to be severely restricted to prevent the loss of dollar resources and that these limitations, if they were to be effective, would so restrict the freedom of the market as largely to nullify the benefits which its advocates desired to bring out. Other considerations, he said, applied to tin and no decision about its future marketing had yet been reached.

Nonferrous Metals Prices

	July 13	July 14	July 15	July 16	July 18	July 19
Copper, electro, Conn.	17.625	17.625	17.625	17.625	17.625	17.625
Copper, Lake, Conn.	17.75	17.75	17.75	17.75	17.75	17.75
Tin, Grade A, New York	$1.03	$1.03	$1.03	$1.03	$1.03	$1.03
Zinc, East St. Louis	9.00	9.00	9.00	9.00	9.50	9.50
Lead, St. Louis	13.80–13.85	13.80–13.85	13.80–13.85	13.80–13.85	13.80–13.85	13.80–13.85

Note: Quotations are going prices.

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, 10,000 lb, freight allowed	17.00
Aluminum pig	16.00
Antimony, American, Laredo, Tex.	38.50
Beryllium copper, 3.75-4.25% Be dollars per lb contained Be	$24.50
Beryllium aluminum 5% Be, dollars per lb contained Be	$52.00
Bismuth, ton lots	$2.00
Cadmium, del'd	$2.00
Cobalt, 97-99% (per lb)	$1.80 to $1.87
Copper, electro, Conn. Valley	17.625
Copper, lake, Conn. Valley	17.75
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$100 to $110
Lead, St. Louis	13.80 to 13.85
Lead, New York	14.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, carlots	34.50
Mercury, dollars per 76-lb flask f.o.b. New York	$82 to $84
Nickel, electro, f.o.b. New York	42.93
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$69 to $72
Silver, New York, cents per oz.	71.50
Tin, Grade A, New York	$1.03
Zinc, East St. Louis	9.50
Zinc, New York	10.20
Zirconium copper, 10-12 pct Zr, per lb contained Zr	$12.00

Remelted Metals

Brass Ingot

(Published prices, cents per lb delivered, carloads)

85-5-5-5 ingot		
No. 115	13.75*	16.00
No. 120	13.25*	15.50
No. 123	12.75*	15.00
80-10-10 ingot		
No. 305		20.50
No. 315		17.50
88-10-2 ingot		
No. 210		27.00
No. 215		24.00
No. 245	16.50*	19.25
Yellow ingot		
No. 405	11.50*	13.75
Manganese bronze		
No. 421		18.50

*F.o.b. Philadelphia.

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	18.00-18.50
0.60 copper, max.	17.75-18.25
Piston alloys (No. 122 type)	15.50-15.75
No. 12 alum. (No. 2 grade)	14.50
108 alloy	15.25-15.50
195 alloy	16.00-16.75
13 alloy	18.50
AXS-679	15.50-16.00
5% Ti, Aluminum, f.o.b., Eddystone, Pa.	
Low copper	31.00
2% copper	28.00

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	15.50-15.75
Grade 2—92-95%	14.50-14.75
Grade 3—90-92%	13.50-13.75
Grade 4—85-90%	12.50-12.75

Electroplating Supplies

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	34⅝
Electrodeposited	28⅞
Rolled, oval, straight, delivered	31.84
Ball anodes	32⅞
Brass, 80-20	
Cast, oval, 15 in. or longer	30¾
Zinc, oval, 99.886, f.o.b. Detroit	22½
Ball anodes	20½
Nickel 99 pct plus	
Cast	59.00
Rolled, depolarized	60.00
Cadmium	$2.15
Silver 999 fine, rolled, 100 oz. lots, per troy oz, f.o.b. Bridgeport, Conn.	79

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	48.00
Copper sulfate, 99.5 crystals, bbl.	9.10
Nickel salts, single or double, 4-100 lb bags, frt. allowed	18.00
Nickel chloride, 300 lb bbl.	24.50
Silver cyanide, 100 oz. lots, per oz.	59
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc sulfate, crystals, 22.5 pct, bags	6.75
Zinc sulfate, 25 pct, flakes, bbl.	7.75

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed)

Flat Sheet: 0.188 in., 2S, 3S, 26.9¢; 4S, 61S-O, 28.8¢; 52S, 30.9¢; 24S-O, 24S-OAL, 29.8¢; 75S-O, 75S-OAL, 36.3¢; 0.081 in., 2S, 3S, 27.9¢; 4S, 61S-O, 30.2¢; 52S, 32.3¢; 24S-O, 24S-OAL, 30.9¢; 75S-O, 75S-OAL, 38¢; 0.032 in., 2S, 3S, 29.5¢; 4S, 61S-O, 33.5¢; 52S, 36.2¢; 24S-O, 24S-OAL, 37.9¢; 75S-O, 75S-OAL, 47.6¢.

Plate: ¼ in. and heavier: 2S, 3S, F, 23.8¢; 4S-F, 26¢; 52S-F, 27.1¢; 61S-O, 26.6¢; 24S-F, 24S-FAL, 27.1¢; 75S-F, 75S-FAL, 33.9¢.

Extruded Solid Shapes: Shape factors 1 to 4, 33.6¢ to 64¢; 11 to 13, 34.6¢ to 76¢; 23 to 25, 36.7¢ to $1.05; 35 to 37, 44¢ to $1.53; 47 to 49, 63.5¢ to $2.20.

Rod, Rolled: 1.064 to 4.5 in., 2S-F, 3S-F, 34¢ to 30.5¢; Cold-finished, 0.375 to 3.5 in., 2S, 3S, 36.5¢ to 32¢.

Screw Machine Stock: Drawn, ⅛ to 11/32 in., 11S-T3, R317-T4, 49¢ to 38¢; cold-finished, ⅜ to 1½ in., 11S-T3, 37.5¢ to 35.5¢; ⅝ to 2 in., R317-T4, 37.5¢ to 34.5¢; rolled, 19/16 to 3 in., 11S-T3, 35.5¢ to 32.5¢; 2⅛ to 3⅜ in., R317-T4, 33.5¢ to 32.5¢. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in.: 2S, 36¢ to 26.5¢; 52S, 44¢ to 32¢; 56S, 47¢ to 38.5¢; 17S-T4, 50¢ to 34.5¢; 61S-T4, 44.5¢ to 34¢; 75S-T6, 76¢ to 55¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed Base quantity 30,000 lb)

Sheet and Plate: Ma, FSa, ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 96¢-$1.01; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher.

Extruded Round Rod: M, diam in., ¼ to 0.311, 58¢; ½ to ¾, 46¢; 1¼ to 1.749, 43¢; 2½ to 5, 41¢. Other alloys higher.

Extruded Square, Hex. Bar: M, size across flats, in., ¼ to 0.311, 61¢; ½ to 0.749, 48¢; 1¼ to 1.749, 44¢; 2½ to 4, 42¢. Other alloys higher.

Extruded Solid Shapes, Rectangles: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb per ft, per. up to 3.5 in., 55¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ to 5/16, $1.14; 5/16 to ⅜, $1.02; ½ to ⅝, 76¢; 1 to 2 in., 65¢; 0.065 to 0.082, ⅝ to 7/16, 85¢; ⅝ to ¾, 62¢; 1 to 2 in., 57¢; 0.165 to 0.219, ⅝ to ¾, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher.

Nickel and Monel

(Base prices, cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	60	47
Strip, cold-rolled	66	50
Rods and shapes		
Hot-rolled	56	45
Cold-drawn	56	45
Angles, hot-rolled	56	45
Plates	58	46
Seamless tubes	89	80
Shot and blocks	..	40

Copper, Brass, Bronze

(Cents per pound, freight prepaid on 200 lb)

	Sheets	Rods	Extruded Shapes
Copper	31.30	....	30.90
Copper, hot-rolled	....	27.15	....
Copper, drawn	....	28.40	....
Low brass	29.17	28.96	32.18*
Yellow brass	27.85	27.54	30.86*
Red brass	29.74	29.43	32.65*
Naval brass	33.74	26.80	28.05
Leaded brass	....	22.37	26.41
Commercial bronze	30.74	30.43	33.40*
Manganese bronze	36.24	30.15	31.65
Phosphor bronze	36.24	30.15	31.65
Muntz metal	30.75	26.31	27.56
Everdur, Herculoy, Olympic, etc.	36.19	35.14	....
Nickel silver, 10 pct	38.90	41.11	41.03
Architectural bronze	....	....	26.41

*Seamless tubing

Scrap Metals

Brass Mill Scrap

(Cents per pound; add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	14⅝	13⅞
Yellow brass	11⅝	10⅝
Red brass	13¼	12⅝
Commercial bronze	13⅜	12⅝
Manganese bronze	11¼	10⅜
Leaded brass rod ends	11⅜	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	13.75
No. 2 copper wire	12.75
Light copper	11.75
Refinery brass	10.50*
Radiators	8.50

*Dry copper content.

Ingot Makers' Scrap

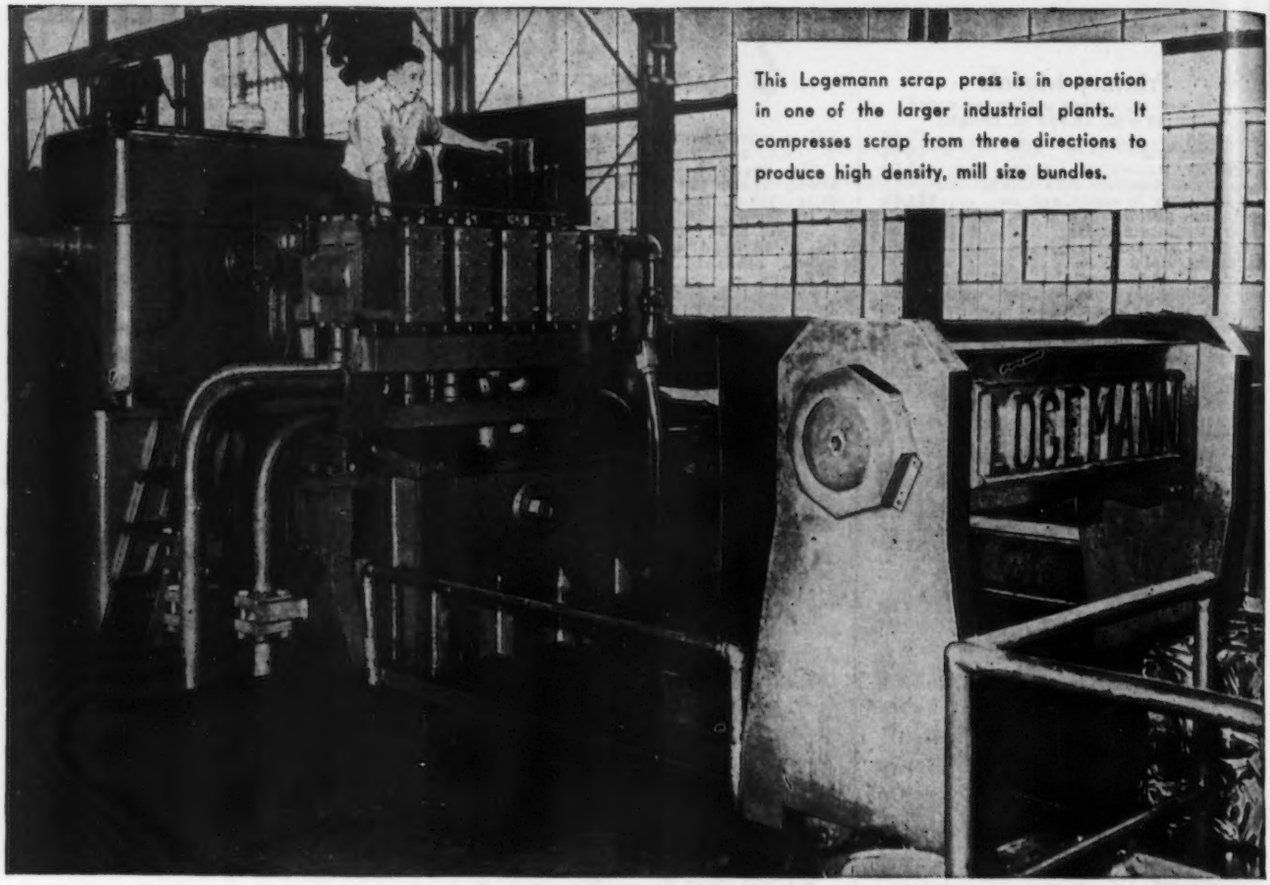
(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire	13.75
No. 2 copper wire	12.75
Light copper	11.75
No. 1 composition	10.25
No. 1 comp. turnings	9.75
Rolled brass	8.00 to 8.25
Brass pipe	9.00
Radiators	8.50
Heavy yellow brass	7.25
Aluminum	
Mixed old cast	7.50
Mixed old clips	7.50
Mixed turnings, dry	6.00
Pots and pans	7.50
Low copper	11.00

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	12 —12¼
No. 2 heavy copper and wire	11 —11¼
Light copper	10 —10¼
Auto radiators (unsweated)	7¼— 7½
No. 1 composition	8¾— 9¼
No. 1 composition turnings	8¼— 8¾
Clean red car boxes	7¼— 7½
Cocks and faucets	7¼— 7½
Mixed heavy yellow brass	6 — 6¼
Old rolled brass	7 — 7¼
Brass pipe	7½— 7¾
New soft brass clippings	10 —10½
Brass rod ends	6½— 7
No. 1 brass rod turnings	5½— 6
Aluminum	
Alum. pistons and struts	3¼— 3½
Aluminum crankcases	5 — 5½
2S aluminum clippings	9 — 9½
Old sheet and utensils	5 — 5½
Borings and turnings	3
Misc. cast aluminum	5 — 5½
Dural clips (24S)	5 — 5½
Zinc	
New zinc clippings	4½— 5
Old zinc	3 — 3½
Zinc routings	2 — 2½
Old die cast scrap	2
Nickel and Monel	
Pure nickel clippings	16 —17
Clean nickel turnings	14 —15
Nickel anodes	16 —17
Nickel rod ends	16 —17
New Monel clippings	10½—11½
Clean Monel turnings	6 — 7
Old sheet Monel	8 — 9
Old Monel castings	7 — 8
Inconel clippings	10 —11
Nickel silver clippings, mixed	6 — 7
Nickel silver turnings, mixed	5½— 6
Lead	
Soft scrap, lead	9 — 9½
Battery plates (dry)	5¾— 6
Magnesium Alloys	
Segregated solids	9 —10
Castings	5½— 6½
Miscellaneous	
Block tin	70 —72
No. 1 pewter	47 —49
No. 1 auto babbitt	40 —42
Mixed common babbitt	11 —11½
Solder joints	10½—11
Siphon tops	45 —47
Small foundry type	12¼—12¾
Monotype	11½—12
Lino. and stereotype	11 —11½
Electrotype	9½—10
New type shell cuttings	10¼—10¾
Hand picked type shells	4
Lino. and stereo. dross	5 — 5½
Electro. dross	3½— 4



This Logemann scrap press is in operation in one of the larger industrial plants. It compresses scrap from three directions to produce high density, mill size bundles.

Self-Contained . . . .
Triple Compression . .
Automatically Controlled

LOGEMANN SCRAP PRESSES

handle high tonnages with minimum labor . . . *at low cost*

•

LOGEMANN METAL BALERS

. . . are built in a large range of sizes to meet specific conditions. Let Logemann's engineering service help you arrive at the most efficient and economical way of handling your scrap.

•

The compact unit illustrated is completely self-contained with oil tank and pump located directly over the press . . . utilizing the advantages of short pipe lines. Automatic controls, mounted in front of pump, give the operator full visibility at all times. Controls operate rams successively within a single rigid box. There is no complex construction which means there is *no need for specially-trained maintenance crews.*

Both two-ram and three-ram models are available with automatic controls or for manual manipulation.

Logemann Bros. Co. have specialized in the production of scrap metal presses for sheet mills, stamping plants, scrap yards, and metal manufacturing plants of all types for nearly 75 years. Write for full information — please state the nature of your scrap and tonnage.

LOGEMANN BROTHERS COMPANY
3164 W. Burleigh Street • Milwaukee 10, Wisconsin

SCRAP

Prices Hold Steady In Weak Market

New York

• • • **Prices remained firm** this week in a market that was very inactive. Last week the mills had stopped delivery on almost all material for fear that it would have to be stored, before reaching its destination, in the advent of a steel strike. Foundries have not shown much interest in increasing their scrap purchases and according to some sources it will definitely be the end of August before some of them will again enter the market. With the 60-day truce in the steel strike, market observers have indicated that it will probably be October before there will be any increased interest in the market by the larger consumers. They could be wrong.

THE IRON AGE scrap composite again remains unchanged at $19.33 per gross ton which is also the low for the year. Prices of No. 1 heavy melting steel this week are: Pittsburgh, $20.50 to $21.00; Chicago, $19.50 to $20.00; and Philadelphia, $17.00 to $18.00.

What large tonnage orders would do to the present market, if available, has been a matter of conjecture by both brokers and dealers. Most market followers are of the opinion that a sizable order would firm the market in a hurry. Last week there was a sale in Pittsburgh for several thousand tons of No. 1 heavy melting at $21.00. This was the high side of the range. While in Buffalo a large consumer bought an estimated 35,000 tons of No. 2 bundles from a Michigan plant list. This large purchase certainly affected the local market since most of the quotations were off 50¢ to $1.00.

In spite of these two routine scrap sales during the past week, it still seems too early to make any predictions as to the future trend of the market. At times prices seem too firm in certain market areas and for no reason whatsoever will again break to lower levels. However, other areas have given every indication that a price increase is possible.

•

CHICAGO—The market which marked time before the strike deadline was still motionless at press time last week. Companies had instructed suppliers to hold shipments until the 16th and then continue to ship if the strike failed to materialize. Carnegie was expected to place limited tonnages of dealer scrap before the week was over. Collections have dropped as much as 50 pct in some cases due to mass July vacations in metal consuming plants.

•

PITTSBURGH—The 60-day postponement of the steel-labor crisis is not expected to have much effect on the present dull market here. A sale of several thousand tons of No. 1 heavy melting at $21.00 tended to confirm the current quotation. No. 1 machinery cast jumped 50¢ to $26.50 to $27.50, but the top price on railroad specialties declined 25¢, making the quotation $23.00 to $23.50.

•

PHILADELPHIA—The threatened steel strike and July vacation periods did not help the market during the past week. Foundries are out of the market for the rest of this month, but have indicated that they may do some buying during August. At present, only one mill is doing any buying. However, this may be changed since the steel strike was called off last week. The collector in this area has gone out of business and the incoming material from this source is negligible. Prices for scrap must be above present levels before the collector will again consider it profitable to resume his operations. All quotations remain unchanged from the previous week.

•

CLEVELAND—A strong undertone was developing in the scrap market here this week, and in the Valley, prompted in part by a growing tendency on the part of brokers and dealers to lay down material. Cast is definitely stronger as a result of releases on shipments by some consumers. Brokers report difficulty in buying cast. Blast furnace grades are showing strength also but the demand is for plant material, direct from the plants. Inventories are being worked down gradually, but indications are that most mills have about 90 days at 70 pct operations. Some mills are releasing shipments held up because of the threatened strike.

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CINCINNATI—Trading is at a minimum in a very quiet scrap market here. Demand for all grades is practically nonexistent, although mills are continuing to take material on their orders. Foundries are taking material as required, which means nominal tonnages in most cases because of sagging demand for castings. A few brokers and dealers are putting material down on a speculative basis, but the tonnages involved thus far are not representative or sufficient to give strength to a weak market.

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DETROIT—The Detroit scrap market has emerged from the strike threat, if anything, more confused than ever. The demand for top quality plant scrap continues but, as has been the case for many weeks, dealer scrap is in the doldrums. While some sources look for a pickup in the market in the near future, there are no positive indications of strength at the moment. Prices of openhearth grades are holding at previous levels in the absence of any substantial buying. Cast grades have held on to the small advance registered a week ago.

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NEW YORK—The market has been very quiet and only a small amount of scrap was moved during the past week. The mills had just about stopped their buying before the truce was reached in the steel strike. This week they are expected to come into the market on a somewhat larger scale. It has already been accepted in the trade that July will be a very dull month with some improvement in activity during August. There has been little demand for the cast grades from the foundries. One that has been closed for some time is again reopening. Another which had two shifts will go on a one-shift basis, consequently little new business is expected from this source. Prices are still nominal since there is still not enough business to determine a going trend in the market.

•

ST. LOUIS—One of the steel mills which had held off a contemplated purchase because of the possibility of a steel strike is expected to come into the market shortly with orders for a small tonnage. Otherwise the calling off of the strike had made little difference in the scrap iron situation. The market is quiet and shipments have been light.

•

BOSTON—Brokers here have dropped their buying prices on No. 1 heavy melting steel. It is quotable this week at $9.50 to $10.00, against last week's $10.00 to $11.00 a ton buying price. This is a new low. Dealers here doubt that the steel strike truce will inject much strength into this dull market.

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BIRMINGHAM—The scrap market here is very inactive as far as heavy melting material is concerned. Some revival in cast grades is reported since inventories have been depleted. A tendency toward firming in cast grades has been noted. Most prices can be described as nominal.

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BUFFALO—Renewed weakness of openhearth scrap had an unsettling effect on other grades late last week. One of the leading consumers bought No. 2 steel at $16.50, a decline of $1.00, and reinstated the $2.00 differential on No. 2 bundles at $14.50. The latter grade last sold at $15.00, or $2.50 under No. 2 steel. The tonnages involved were small. Reports that one of the chief local consumers recently bought a Michigan plant list, consisting mostly of No. 1 bundles and estimated at over 35,000 tons, for shipment here was regarded as a major factor in the latest reductions. No. 1 heavy melting was lowered 50¢ a ton to $18.50-$19.00, and cast scrap and rail items lost $1.00. Blast furnace grades were nominally unchanged.

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	$20.50 to $21.00
R.R. hvy. melting	21.00 to 22.00
No. 2 hvy. melting	18.50 to 19.00
No. 2 bundles	16.50 to 17.00
R.R. scrap rails	21.50 to 22.00
Rails 2 ft and under	25.00 to 25.50
No. 1 comp'd bundles	20.50 to 21.00
Hand bdld. new shts.	18.50 to 19.00
Hvy. steel forge turn.	17.50 to 18.00
Mach. shop turn.	13.00 to 13.50
Shoveling turn.	16.00 to 16.50
Mixed bor. and ms. turn.	13.00 to 13.50
Cast iron borings	16.00 to 16.50
No. 1 mach. cast.	26.50 to 27.50
Mixed yard cast.	21.50 to 22.50
Hvy. breakable cast.	18.50 to 19.00
Malleable	21.50 to 22.00
RR. knuck. and coup.	23.00 to 23.50
RR. coil springs	23.00 to 23.50
RR. leaf springs	23.00 to 23.50
Rolled steel wheels	23.00 to 23.50
Low phos.	21.50 to 22.00

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$19.50 to $20.00
No. 2 hvy. melting	17.50 to 18.00
Factory bundles	19.50 to 20.00
No. 1 dealers' bundles	16.00 to 17.00
No. 2 dealers' bundles	15.00 to 16.00
Mach. shop turn.	11.00 to 12.00
Short shov. turn.	13.00 to 14.00
Cast iron borings	12.00 to 13.00
Mix. borings and turn.	9.00 to 10.00
Low phos. hvy. forge	23.00 to 24.00
Low phos. plates	21.00 to 22.00
No. 1 RR. hvy. melt.	21.50 to 23.25
Rerolling rails	27.50 to 28.25
Miscellaneous rails	23.50 to 24.00
Angles and splice bars	24.50 to 25.50
Locomotive tires, cut	26.50 to 27.50
Cut bolster & side frames	24.00 to 25.00
Standard stl. car axles	27.25 to 29.00
No. 3 steel wheels	23.25 to 23.75
Couplers and knuckles	23.00 to 23.50
Rails, 2 ft and under	27.00 to 28.00
Malleable	24.00 to 25.00
No. 1 mach. cast.	30.00 to 32.00
No. 1 agricul. cast.	29.00 to 30.00
Heavy breakable cast.	23.50 to 24.00
RR. grate bars	16.00 to 17.00
Cast iron brake shoes	18.00 to 20.00
Cast iron car wheels	28.00 to 29.00

CINCINNATI

Per gross ton, f.o.b. cars:

No. 1 hvy. melting	$16.50 to $17.00
No. 2 hvy. melting	15.00 to 15.50
No. 1 bundles	16.50 to 17.00
No. 2 bundles	13.00 to 14.00
Mach. shop turn.	7.00 to 8.00
Shoveling turn.	7.00 to 8.00
Cast iron borings	8.00 to 9.00
Mixed bor. and turn.	7.00 to 8.00
Low phos. 18 in. under	24.00 to 25.00
No. 1 cupola cast.	25.00 to 26.00
Hvy. breakable cast.	17.00 to 18.00
Rails 18 in. and under	27.00 to 28.00
Rails random length	19.00 to 20.00
Drop broken	27.00 to 28.00

BOSTON

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$9.50 to $10.00
No. 2 hvy. melting	8.00 to 8.50
No. 1 bundles	9.50 to 10.00
No. 2 bundles	8.00 to 8.50
Bushelings	7.50 to 8.00
Shoveling turn.	7.00 to 7.50
Machine shop turn.	3.00 to 3.50
Mixed bor. and turn.	2.50 to 3.00
Cl'n cast chem. bor.	9.00 to 10.00
No. 1 machinery cast.	26.00 to 29.00
No. 2 machinery cast.	18.00 to 21.50
Heavy breakable cast.	16.00 to 17.00
Stove plate	16.00 to 17.00

DETROIT

Per gross ton, brokers' buying prices f.o.b. cars:

No. 1 hvy. melting	$12.50 to $13.00
No. 2 hvy. melting	10.50 to 11.00
No. 1 bundles	12.50 to 13.00
New busheling	12.50 to 13.00
Flashings	12.50 to 13.00
Mach. shop turn.	7.00 to 7.50
Shoveling turn.	8.00 to 8.50
Cast iron borings	8.00 to 8.50
Mixed bor. and turn	7.00 to 7.50
Low phos. plate	12.50 to 13.00
Heavy breakable cast.	15.00 to 18.00
Stove plate	16.00 to 17.00
Automotive cast.	22.00 to 24.00
No. 1 cupola cast.	22.00 to 23.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	$17.00 to $18.00
No. 2 hvy. melting	16.00 to 17.00
No. 1 bundles	17.00 to 18.00
No. 2 bundles	15.00 to 16.00
Mach. shop turn.	10.50 to 11.50
Shoveling turn.	12.50 to 13.50
Mixed bor. and turn.	10.00 to 10.50
Clean cast chemical bor.	16.00 to 17.00
No. 1 machinery cast.	27.00 to 28.00
No. 1 mixed yard cast.	24.00 to 25.00
Hvy. breakable cast	23.00 to 24.00
Hvy. axle forge turn.	17.00 to 18.00
Low phos. punchings, plate	20.00 to 21.00
Low phos. 5 ft and under	19.00 to 20.00
Low phos. bundles	17.00 to 18.00
RR. steel wheels	22.00 to 22.50
RR.coil springs	22.00 to 22.50
RR. malleable	23.00 to 24.00
Cast iron carwheels	27.00 to 28.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	$18.00 to $19.00
No. 2 hvy. melting	17.00 to 18.00
No. 2 bundled sheets	15.00 to 16.00
Mach. shop turn.	10.00 to 11.00
Shoveling turnings	10.00 to 11.00
Locomotive tires, uncut	18.00 to 19.00
Mis. std. sec. rails	21.00 to 22.00
Steel angle bars	23.00 to 24.00
Rails 3 ft and under	25.00 to 26.00
RR. steel springs	21.00 to 22.00
Steel car axles	21.00 to 22.00
Brake shoes	19.00 to 20.00
Malleable	19.00 to 20.00
Cast iron car wheels	24.00 to 25.00
No. 1 machinery cast.	23.00 to 25.00
Hvy. breakable cast.	19.00 to 20.00
Stove plate	20.00 to 21.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	$18.00
No. 2 hvy. melting	16.00
No. 2 bundles	14.00
No. 1 busheling	16.00
Long turnings	13.00
Shoveling turnings	15.00
Cast iron borings	15.00
Bar crops and plate	22.50
Structural and plate	22.50
No. 1 cupola cast.	$27.00 to 28.00
Stove plate	20.00
No. 1 RR. hvy. melt.	20.00 to 20.50
Steel axles	20.00
Scrap rails	20.00
Rerolling rails	22.50 to 23.00
Angles & splice bars	22.00 to 23.00
Rails 2 ft & under	23.00 to 24.00
Cast iron carwheels	17.00 to 18.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	$19.50 to $20.00
No. 2 hvy. melting	17.00 to 17.50
No. 1 bundles	19.50 to 20.00
No. 2 bundles	15.50 to 16.00
Mach. shop turn.	10.00 to 10.50
Short shov. turn.	16.00 to 16.50
Cast iron borings	16.00 to 16.50
Low phos.	20.50 to 21.00

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$11.00 to $11.50
No. 2 hvy. melting	10.00 to 10.50
No. 2 bundles	9.00 to 10.00
Mach. shop turn.	5.25 to 5.75
Mixed bor. turn.	4.75 to 5.25
Shoveling turnings	7.00 to 8.00
No. 1 machinery cast	18.50 to 19.50
Mixed yard cast.	17.50 to 18.50
Heavy breakable cast.	16.00 to 16.50
Charging box cast.	16.00 to 16.50
Unstrp. motor blks.	14.50 to 15.00
Cl'n cast chem. bor.	11.00 to 12.00

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$18.50 to $19.00
No. 2 hvy. melting	16.00 to 16.50
No. 1 bundles	16.00 to 16.50
No. 2 bundles	14.00 to 14.50
No. 1 busheling	16.00 to 16.50
Mach. shop turn.	10.00 to 10.50
Shoveling turn.	13.50 to 14.50
Cast iron borings	13.50 to 14.00
Mixed bor. and turn.	13.50 to 14.00
Cupola cast.	21.00 to 22.00
Mixed yard cast.	19.00 to 20.00
Stove plate	19.00 to 20.00
Small indus. malleable	17.00 to 18.00
Low phos. plate	19.50 to 20.50
Scrap rails	22.00 to 23.00
Rails 3 ft and under	29.00 to 30.00
RR. steel wheels	22.00 to 23.00
RR. coil & leaf spgs.	22.00 to 23.00
RR. knuckles & coup.	22.00 to 23.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	$16.00 to $16.50
No. 2 hvy. melting	14.50 to 15.00
No. 1 bundles	16.00 to 16.50
No. 2 bundles	13.50 to 14.00
No. 1 busheling	16.00 to 16.50
Drop forge flashings	16.00 to 16.50
Mach. shop turn.	8.50 to 9.00
Shoveling turn.	14.00 to 14.50
Steel axle turn.	16.00 to 16.50
Cast iron borings	14.00 to 14.50
Mixed bor. & turn.	14.00 to 14.50
Low phos. 2 ft and under	16.50 to 17.00
No. 1 mach. cast.	26.50 to 27.00
Malleable	20.00 to 21.00
RR. cast.	26.50 to 27.50
Railroad grate bars	19.50 to 20.00
Stove plate	19.50 to 20.00
RR. hvy. melting	17.00 to 17.50
Rails 3 ft and under	25.00 to 26.00
Rails 18 in. and under	27.00 to 28.00

SAN FRANCISCO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$20.00
No. 2 hvy. melting	18.00
No. 1 bales	16.00
No. 2 bales	16.00
No. 3 bales	13.00
Mach. shop turn.	12.00
Elec. fur. 1 ft under	28.00
No. 1 cupola cast.	$20.00 to 25.00
RR. hvy. melting	20.00
Rails	23.00

LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	$20.00
No. 2 hvy. melting	18.00
No. 1 bales	16.00
No. 2 bales	16.00
No. 3 bales	13.00
Mach. shop turn.	12.00
Elec. fur. 1 ft under	30.00
No. 1 cupola cast.	$24.00 to 26.00
RR. hvy. melting	20.00

SEATTLE

Per gross ton delivered to consumer:

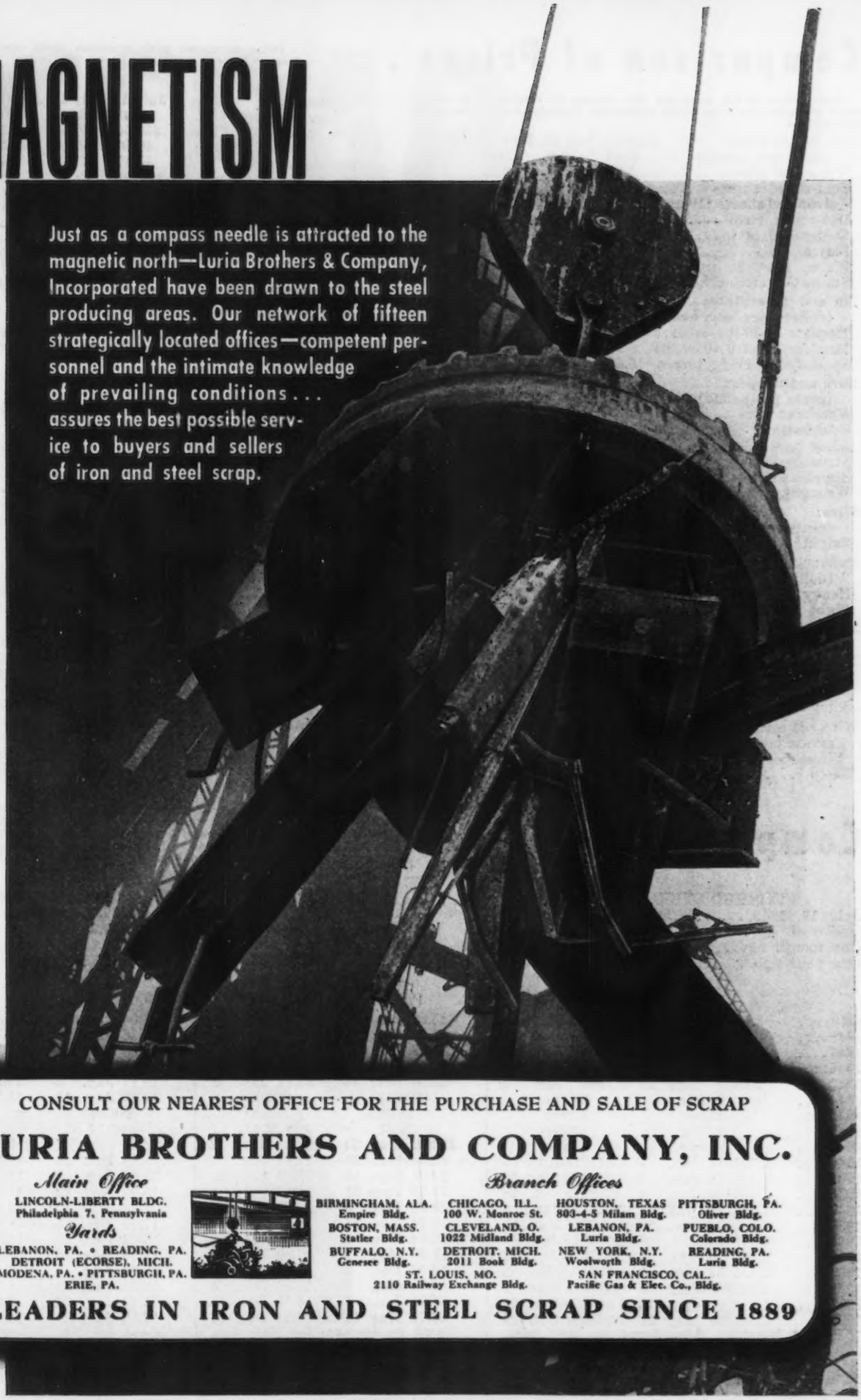
No. 1 & No. 2 hvy. melt.	$17.00
No. 1 & No. 2 bales	16.00
No. 3 bales	13.00
Elec. fur. 1 ft and under	22.00
No. 1 cupola cast.	$20.00 to 27.00
RR. hvy. melting	20.00

HAMILTON, ONT.

Per gross ton delivered to consumer: Cast Grades f.o.b. shipping point:

Heavy melting	$21.00
No. 1 bundles	21.00
No. 2 bundles	20.50
Mechanical bundles	19.00
Mixed steel scrap	17.00
Mixed borings and turnings	15.00
Rails, remelting	21.00
Rails, rerolling	24.00
Bushelings	15.50
Bushelings, new fact, processed	19.00
Bushelings, new fact, unprocessed	14.00
Short steel turnings	15.00
Cast scrap	$25.00 to 26.00

MAGNETISM



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PUEBLO, COLO. Colorado Bldg.
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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices . .

Price advances over previous week are printed in Heavy Type: declines appear in *Italics*.

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	July 19, 1949	July 12, 1949	June 21, 1949	July 20, 1948
Hot-rolled sheets	3.25	3.25	3.25	2.775
Cold-rolled sheets	4.00	4.00	4.00	3.495
Galvanized sheets (10 ga)	4.40	4.40	4.40	3.913
Hot-rolled strip	3.25	3.25	3.25	2.775
Cold-rolled strip	4.038	4.038	4.038	3.535
Plates	3.40	3.40	3.40	2.93
Plates wrought iron	7.85	7.85	7.85	7.25
Stains C-R strip (No. 302)	33.25	33.25	33.25	30.50
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes	$7.75	$7.75	$7.75	$6.70
Tinplate, electro (0.50 lb)	6.70	6.70	6.70	5.90
Special coated mfg. ternes	6.65	6.65	6.65	5.80
Bars and Shapes: (cents per pound)				
Merchant bars	3.35	3.35	3.35	2.875
Cold-finished bars	3.995	3.995	3.995	3.483
Alloy bars	3.75	3.75	3.75	3.213
Structural shapes	3.25	3.25	3.25	2.767
Stainless bars (No. 302)	28.50	28.50	28.50	26.00
Wrought iron bars	9.50	9.50	9.50	8.65
Wire: (cents per pound)				
Bright wire	4.15	4.15	4.15	3.608
Rails: (dollars per 100 lb)				
Heavy rails	$3.20	$3.20	$3.20	$2.725
Light rails	3.55	3.55	3.55	3.05
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$52.00	$52.00	$52.00	$45.00
Slabs, rerolling	52.00	52.00	52.00	45.00
Forging billets	61.00	61.00	61.00	54.00
Alloy blooms, billets, slabs	63.00	63.00	63.00	66.00
Wire rod and Skelp: (cents per pound)				
Wire rods	3.40	3.40	3.40	3.133
Skelp	3.25	3.25	3.25	2.888

Pig Iron: (per gross ton)	July 19, 1949	July 12, 1949	June 21, 1949	July 20, 1948
No. 2, foundry, Phila.	$50.56	$50.56	$50.56	$44.74
No. 2, Valley furnace	46.50	46.50	46.50	43.50
No. 2, Southern Cin'ti*	45.47	45.47	45.47	48.14
No. 2, Birmingham	39.38	39.38	39.38	42.05
No. 2, foundry, Chicago†	46.50	46.50	46.50	43.00
Basic del'd Philadelphia*	49.74	49.74	49.74	44.24
Basic, Valley furnace	46.00	46.00	46.00	43.00
Malleable, Chicago†	46.50	46.50	46.50	43.50
Malleable, Valley	46.50	46.50	46.50	43.50
Charcoal, Chicago	73.78	73.78	73.78	69.55
Ferromanganese‡	173.40	173.40	173.40	145.00

†The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy page.
*Does not include interim increase on total freight charges, effective Jan. 11, 1949.

Scrap (per gross ton)	July 19, 1949	July 12, 1949	June 21, 1949	July 20, 1948
Heavy melt'g steel, P'gh.	$20.75	$20.75	$21.50	$40.25
Heavy melt'g steel, Phila.	17.50	17.50	18.50	42.50
Heavy melt'g steel, Ch'go	19.75	19.75	20.75	41.25
No. 1, hy. comp. sh't Det.	12.75	12.75	14.75	38.25
Low phos. Young'n	21.25	21.25	22.25	45.25
No. 1, cast, Pittsburgh	27.00	26.50	26.50	63.75
No. 1, cast, Philadelphia	27.50	27.50	27.50	65.50
No. 1, cast, Chicago	31.00	31.00	28.88	73.00
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.25	$14.25	$14.25	$13.75
Foundry coke, prompt	16.25	16.25	16.25	16.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	17.625	17.625	16.00	21.50
Copper, Lake Conn.	17.75	17.75*	18.625	21.625
Tin, Grade A, New York	$1.03	$1.03	$1.03	$1.03
Zinc, East St. Louis	9.50	9.00	9.00	12.00
Lead, St. Louis	13.825	13.35*	11.85	17.30
Aluminum, virgin	17.00	17.00	17.00	16.00
Nickel, electrolytic	42.93	42.93	42.93	36.56
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	38.50	38.50	38.50	35.00

*Revised

Composite Prices . .

Starting with the issue of May 12, 1949 the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive, see p. 139 of May 12, 1949 issue.

	FINISHED STEEL (Base Price)	PIG IRON	SCRAP STEEL
July 19, 1949	3.705¢ per lb.	$45.91 per gross ton	$19.33 per gross ton
One week ago	3.705¢ per lb.	$45.91 per gross ton	$19.33 per gross ton
One month ago	3.705¢ per lb.	$45.91 per gross ton	$20.25 per gross ton
One year ago	3.211¢ per lb.	$42.96 per gross ton	$41.33 per gross ton

	HIGH		LOW		HIGH		LOW		HIGH		LOW	
1949	3.720¢	Jan. 1	3.705¢	May 3	$46.82	Jan. 4	$45.91	May 10	$43.00	Jan. 1	$19.33	June 28
1948	3.721¢	July 27	3.193¢	Jan. 1	46.91	Oct. 12	39.58	Jan. 6	43.16	July 27	39.75	Mar. 9
1947	3.193¢	July 29	2.848¢	Jan. 1	37.98	Dec. 30	30.14	Jan. 7	42.58	Oct. 28	29.50	May 20
1946	2.848¢	Dec. 31	2.464¢	Jan. 1	30.14	Dec. 10	25.37	Jan. 1	31.17	Dec. 24	19.17	Jan. 1
1945	2.464¢	May 29	2.396¢	Jan. 1	25.37	Oct. 23	23.61	Jan. 2	19.17	Jan. 2	18.92	May 22
1944	2.396¢		2.396¢		$23.61		$23.61		19.17	Jan. 11	15.76	Oct. 24
1943	2.396¢		2.396¢		23.61		23.61		$19.17		$19.17	
1942	2.396¢		2.396¢		23.61		23.61		19.17		19.17	
1941	2.396¢		2.396¢		$23.61	Mar. 20	$23.45	Jan. 2	$22.00	Jan. 7	$19.17	Apr. 10
1940	2.30467¢	Jan. 2	2.24107¢	Apr. 16	23.45	Dec. 23	22.61	Jan. 2	21.83	Dec. 30	16.04	Apr. 9
1939	2.35367¢	Jan. 3	2.26689¢	May 16	22.61	Sept. 19	20.61	Sept. 12	22.50	Oct. 3	14.08	May 16
1938	2.58414¢	Jan. 4	2.27207¢	Oct. 18	23.25	June 21	19.61	July 6	15.00	Nov. 22	11.00	June 7
1937	2.58414¢	Mar. 9	2.32263¢	Jan. 4	23.25	Mar. 9	20.25	Feb. 16	21.92	Mar. 30	12.67	June 9
1936	2.32263¢	Dec. 28	2.05200¢	Mar. 10	19.74	Nov. 24	18.73	Aug. 11	17.75	Dec. 21	12.67	June 8
1935	2.07642¢	Oct. 1	2.06492¢	Jan. 8	18.84	Nov. 5	17.83	May 14	13.42	Dec. 10	10.33	Apr. 29
1934	2.15367¢	Apr. 24	1.95757¢	Jan. 2	17.90	May 1	16.90	Jan. 27	13.00	Mar. 13	9.50	Sept. 25
1933	1.95578¢	Oct. 3	1.75836¢	May 2	16.90	Dec. 5	13.56	Jan. 3	12.25	Aug. 8	6.75	Jan. 3
1932	1.89196¢	July 5	1.83901¢	Mar. 1	14.81	Jan. 5	13.56	Dec. 6	8.50	Jan. 12	6.43	July 5
1931	1.99626¢	Jan. 13	1.86586¢	Dec. 29	15.90	Jan. 6	14.79	Dec. 15	11.33	Jan. 6	8.50	Dec. 29
1929	2.31773¢	May 28	2.26498¢	Oct. 29	18.71	May 14	18.21	Dec. 17	17.58	Jan. 29	14.08	Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

SCRAP

AS NEAR AS YOUR TELEPHONE

. . . For over 50 years Alter Company has built a reputation for the "Best in Scrap Service," which includes the supplying of all grades of scrap which you consume and the absorbing of scrap which you produce.

Cast Iron
Electric Furnace Grades
Open Hearth
Foundry Steel
Sheet Iron for Baling
Stainless Steel
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Over 50 Years

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1700 ROCKINGHAM ROAD . DAVENPORT 2, IOWA

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. producing points in cents per pound unless otherwise indicated. Extras apply. (1) Widths up to 12-in. inclusive. (2) 0.25 carbon and less. (3) Cokes, 1.25 lb, deduct 25¢ per base box. (4) 18 gage and heavier. (5) For straight length material only from producers to fabricators. (6) Also shafting. For quantities of 40,000 lb and over. (7) Carload lot in manufacturing trade. (8) Hollowware enameling, gages 29 to 31 only. (9) Produced to dimensional tolerances in AISI Manual Sec. 6. (10) Slab prices subject to negotiation in most cases. (11) San Francisco only. (12) Los Angeles only. (13) San Francisco and Los Angeles only. (14) Seattle only. (15) Seattle and Los Angeles only.

PRODUCTS	Base prices at producing points apply to the sizes and grades produced in these areas														
	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio		Detroit	Johnstown	Seattle, S. Frisco, LosAngeles	Fontana
INGOTS Carbon forging	$66.00											$50.00			
Alloy	$51.00						(per net ton)					$51.00			
BILLETS, BLOOMS, SLABS Carbon, rerolling[10]	$52.00				$52.00	$52.00	(per net ton)						$52.00		$71.00
Carbon forging billets	$61.00	$61.00	$61.00	$61.00	$61.00	$61.00	(per net ton)					$61.00	$61.00		$86.00
Alloy	$63.00	$63.00				$63.00	(Bethlehem, Canton, Massillon = $63.00) (per net ton)					$63.00			$82.00
PIPE SKELP	3.25						3.25				Warren = 3.25				
WIRE RODS	3.40	3.40		3.40	3.40		3.40	3.50			Worcester 3.70		3.40	4.05[11] 4.20[12]	
SHEETS Hot-rolled[4]	3.25	3.25	3.25	3.25	3.25	3.25 (Conshohocken, Pa. 3.35)	3.25	3.25		Warren, Ashland = 3.25		3.45		3.95[13]	4.15
Cold-rolled	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.20	4.00	Warren 4.00	4.20		Pittsburg, Cal. 4.95	4.90
Galvanized (10 gage)	4.40	4.40	4.40		4.40			4.40	Canton =4.40	4.40	Ashland =4.40			5.15[13]	
Enameling (12 gage)	4.40	4.40	4.40	4.40			4.40		4.60	4.40		4.70			
Long ternes (10 gage)	4.80		4.80							4.80					
STRIP Hot-rolled[1]	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25		3.25	Warren = 3.25	3.45		4.00 to 4.25	4.40
Cold-rolled[2]	4.00	4.15		4.00		4.00	4.80	4.00		New Haven 4.50 Warren = 4.00 to 4.25		4.20 to 4.25			4.90
TINPLATE Cokes, 1.50 lb.[3] base box	$7.75	$7.75	$7.75		$7.85			$7.85	$7.95	Warren, Ohio =$7.75				Pittsburg, Cal. = $8.50	
Electrolytic 0.25, 0.50, 0.75 lb. box	Deduct $1.30, $1.05 and 75¢ respectively from 1.50 lb. coke base box price														
TERNES MFG., special coated	Deduct $1.10 from 1.50 lb. coke base box price														
BLACKPLATE CANMAKING 55 to 128 lb.	Deduct $2.00 from 1.50 lb. coke base box price														
BLACKPLATE, h.o., 29 ga.[8]	5.30	5.30	5.30					5.40		Warren, Ohio =5.30					
BARS Carbon Steel	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35		3.35	Canton =3.35	3.55	3.35	4.05	4.00
Reinforcing[5]	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35			Canton =3.35		3.35	4.05 to 4.10	4.00
Cold-finished[6]	3.95 to 4.00	4.00	4.00	4.00		4.00	4.00					4.30			
Alloy, hot-rolled	3.75	3.75	3.75			3.75	3.75	Bethlehem, Canton, Massillon=3.75				4.05	3.75	4.80[13]	4.75
Alloy cold-drawn	4.65	4.65	4.65	4.65		4.65	4.65	Massillon=4.65			Worcester 4.95				
PLATE Carbon steel[9]	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40 Coatesville=3.50, Claymont=3.50 Geneva=3.40, Harrisburg=3.50				3.65	3.40	4.30[14]	4.00
Floor plates	4.55	4.55		4.55				Conshohocken=4.55							
Alloy	4.40	4.40							Coatesville=4.50						
SHAPES, Structural	3.25	3.25	3.25		3.25	3.30	Bethlehem=3.30, Geneva, Utah=3.25						3.30	3.80 to 3.90[14]	3.80
MANUFACTURERS' WIRE[7] Bright	4.15	4.15		4.15	4.15		4.15	4.25	Duluth=4.15, Worcester=4.45				4.15	5.15[11]	
Spring (high carbon)	5.20	5.20		5.20				5.30	Worcester=5.50 New Haven, Trenton=5.50				5.20	Duluth=5.20-6.15	
PILING, Steel sheet	4.05	4.05				4.05									

STAINLESS STEELS

Base prices, in cents per pound, f.o.b. producing point

Product	Chromium Nickel							Straight Chromium		
	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	12.75	13.50	15.00	15.50	22.75	18.25	20.00	11.25	13.75	11.50
Slabs, billets, rerolling	17.00	18.25	20.25	19.25	30.25	24.50	26.75	15.00	18.50	15.25
Forg. discs, die blocks, rings	30.50	30.50	33.00	32.00	49.00	36.50	41.00	24.50	25.00	25.00
Billets, forging	24.25	24.25	26.25	25.50	39.00	29.00	32.75	19.50	20.00	20.00
Bars, wire, structurals	28.50	28.50	31.00	30.00	46.00	34.00	38.50	23.00	23.50	23.50
Plates	32.00	32.00	34.80	34.00	50.50	39.50	44.00	26.00	26.50-27.00	26.50
Sheets	37.50	37.50	39.50	39.50	53.00	45.50	50.00	33.00	33.50	35.50
Strip, hot-rolled	24.25	25.75	30.00	27.75	46.00	34.50	38.75	21.25	28.00	21.75
Strip, cold-rolled	30.50	33.00	36.50	35.00	55.00	44.50	48.50	27.00	33.50	27.50

ELECTRODES

Cents per lb. f.o.b. plant, threaded electrodes with nipples, unboxed

Diameter in in.	Length in in.	
Graphite		
17, 18, 20	60, 72	16.00¢
8 to 16	48, 60, 72	16.50¢
7	48, 60	17.75¢
6	48, 60	19.00¢
4, 5	40	19.50¢
3	40	20.50¢
2½	24, 30	21.00¢
2	24, 30	23.00¢
Carbon		
40	100, 110	7.50¢
35	65, 110	7.50¢
30	65, 84, 110	7.50¢
24	72 to 104	7.50¢
17 to 20	84, 90	7.50¢
14	60, 72	8.00¢
10, 12	60	8.25¢
8	60	8.50¢

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	90.5¢
18	4	1	—	5	$1.42
18	4	2	—	—	$1.025
1.5	4	1.5	8	—	65¢
6	4	2	6	—	69.5¢

High-carbon-chromium ..... 52¢
Oil hardened manganese ..... 29¢
Special carbon ..... 26.5¢
Extra carbon ..... 22¢
Regular carbon ..... 19¢

Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi, 4½¢ higher.

ELECTRICAL SHEETS

24 gage, HR cut lengths, f.o.b. mill

	Cents per lb
Armature	5.45
Electrical	5.95
Motor	6.70
Dynamo	7.50
Transformer 72	8.05
Transformer 65	8.60
Transformer 58	9.30
Transformer 52	10.10

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb ..... $3.20†
Joint bars, 100 lb 4.25
Light rails per 100 lb 3.55

	Base Price cents per lb
Track spikes	5.35
Axles	5.20
Screw spikes	8.00
Tie plates	4.05
Tie plates, Pittsburg, Calif.*	4.20
Track bolts, untreated	8.25
Track bolts, heat treated, to railroads	8.50

*Seattle, add 30¢
†CF&I, $3.30.

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.00¢
0.41 to 0.60 carbon	5.50¢
0.61 to 0.80 carbon	6.10¢
0.81 to 1.05 carbon	8.05¢
1.06 to 1.35 carbon	10.35¢

Worcester, add 0.30¢.

CLAD STEEL

Base prices, cents per pound, f.o.b. mill

Stainless-carbon	Plate	Sheet
No. 304, 20 pct,		
Coatesville, Pa.	*26.50	
Washington, Pa.	*26.50	*22.50
Claymont, Del.	*26.50	
Conshohocken, Pa.		*22.50
Nickel-carbon		
10 pct, Coatesville	27.50	
Inconel-carbon		
10 pct, Coatesville	36.00	
Monel-carbon		
10 pct, Coatesville	29.00	
No. 302 Stainless-copper-stainless, Carnegie, Pa.		75.00
Aluminized steel sheets		
Hot dip, Butler, Pa.		7.75

*Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

	Base Column Pittsburg, Calif.
Standard & coated nails*	103 123
Galvanized nails*	103 123
Woven wire fence†	109 132
Fence posts, carloads††	114 ...
Single loop bale ties	106 130
Galvanized barbed wire**	123 143
Twisted barbless wire	123 ...

* Pgh., Chi., Duluth; Worcester, 6 columns higher. † 15½ gage and heavier. ** On 80 rod spools, in carloads. †† Duluth only.

	Base per 100 lb	*Pittsburg, Calif.*
Annealed fence wire‡	$4.80	$5.75
Annealed, galv. fencing‡	5.25	6.20
Cut nails, carloads‡‡	6.75	...

‡ Add 30¢ at Worcester; 10¢ at Sparrows Pt.
‡‡ Less 20¢ to jobbers.

HIGH STRENGTH, LOW ALLOY STEELS

Mill base prices, cents per pound

Steel	Aldecor	Corten	Double Strength No. 1	Dyn-alloy	HI Steel	Mayari R	Otis-coloy	Yoloy	NAX High Tensile
Producer	Republic	Carnegie-Illinois, Republic Sharon*	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Sharon*
Plates	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.45
Sheets									
Hot-rolled	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95	5.15
Cold-rolled	6.05	6.05	6.05	.....	6.05	6.05	6.05	6.05	6.25
Galvanized	.....	6.75	.....	.....	.....	6.75	.....	.....	.....
Strip									
Hot-rolled	4.95	4.95	4.95	.....	4.95	4.95	4.95	4.95	5.15
Cold-rolled	.....	.....	6.05	.....	.....	6.05	6.05	6.05	6.25
Shapes	.....	4.95	.....	.....	4.95	5.05	4.95	4.95	.....
Beams	.....	4.95	.....	.....	.....	.....	.....	.....	.....
Bars									
Hot-rolled	5.10	5.10	5.10	.....	5.10	5.10	5.10	5.10	5.30
Bar shapes	.....	5.10	.....	.....	5.10	5.10	5.10	5.10	.....

* Sheets and strip.

PIPE AND TUBING

Base discounts, f.o.b. mills, Base price, about $200.00 per net ton.

STANDARD, THREADED AND COUPLED

Steel, buttweld*	Black	Galv.
½-in.	43 to 41	26½ to 24½
¾-in.	46 to 44	30½ to 28½
1-in.	48½ to 46½	33½ to 31½
1¼-in.	49 to 47	34 to 32
1½-in.	49½ to 47½	34½ to 32½
2-in.	50 to 48	35 to 33
2½ to 3-in.	50½ to 48½	35½ to 33½
Steel, lapweld		
2-in.	39½	26 to 24
2½ to 3-in.	43½ to 42½	28 to 27
3½ to 6-in.	46½ to 42½	31 to 27
Steel, seamless		
2-in.	38½ to 27	23 to 11½
2½ to 3-in.	41½ to 32½	26 to 17
3½ to 6-in.	43½ to 38½	28 to 23
Wrought Iron, buttweld		
½-in.	+20½	+47
¾-in.	+10½	+36
1 & 1¼ in.	+ 4½	+27
2-in.	— 1½	+23½
3-in.	— 2	+23
Wrought Iron, lapweld		
2-in.	+ 7½	+31
2½ to 3½-in.	+ 5	+26½
4-in.	list	+20½
4½ to 8-in.	+ 2	+22

EXTRA STRONG, PLAIN ENDS

Steel, buttweld		
½-in.	42 to 40	27 to 25
¾-in.	46 to 44	31 to 29
1-in.	48 to 46	34 to 32
1¼-in.	48½ to 46½	34½ to 32½
1½-in.	49 to 47	35 to 33
2-in.	49½ to 47½	35½ to 34½
2½ to 3-in.	50 to 48	36 to 34
Steel, lapweld		
2-in.	39½ to 38½	25 to 24
2½ to 3-in.	44½ to 42½	30 to 28
3½ to 6-in.	48 to 44	33½ to 31½
Steel, seamless		
2-in.	37½ to 32½	23 to 18
2½ to 3-in.	41½ to 36½	27 to 23
3½ to 6-in.	45	30½
Wrought Iron, buttweld		
½-in.	+16	+40
¾-in.	+ 9½	+34
1 to 2-in.	— 1½	+23
Wrought Iron, lapweld		
2-in.	+ 4½	+27½
2½ to 4-in.	— 5	+16
4½ to 6-in.	— 1	+20½

For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. *Fontana, Calif., deduct 11 points from figures in left columns.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut length 4 to 24 ft inclusive.

OD in In.	Gage BWG	Seamless H.R.	Seamless C.R.	Electric Weld H.R.	Electric Weld C.D.
2	13	$19.18	$22.56	$18.60	$21.89
2½	12	25.79	30.33	25.02	29.41
3	12	28.68	33.76	27.82	32.74
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78

CAST IRON WATER PIPE

	Per net ton
6 to 24-in., del'd Chicago	$95.70
6 to 24-in., del'd N. Y.	$92.50 to 97.40
6 to 24-in., Birmingham	82.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	109.30

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts

	Pct Off List
½ in. & smaller x 6 in. & shorter	35
9/16 & ⅝ in. x 6 in. & shorter	37
¾ in. & larger x 6 in. shorter	34
All diam., longer than 6 in.	30
Lag, all diam over 6 in. longer	35
Lag, all diam x 6 in. & shorter	37
Plow bolts	47

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller	35
9/16 to 1 in. inclusive	34
1⅛ to 1½ in. inclusive	32
1⅝ in. and larger	27

On above bolts and nuts, excepting plow bolts, additional allowances of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifinished Hexagon Nuts

	USS	SAE
7/16 in. and smaller	..	41
½ in. and smaller	38	..
½ in. through 1 in.	..	39
9/16 in. through 1 in.	37	..
1⅛ in. through 1½ in.	35	37
1⅝ in. and larger	28	..

In full case lots, 15 pct additional discount.

Stove Bolts

Packages, nuts separate	$61.75
In bulk	70.00

Large Rivets

(½ in. and larger)

	Base per 100 lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	$6.75
F.o.b. Lebanon, Pa.	6.75

Small Rivets

(7/16 in. and smaller)

	Pct off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	48

Cap and Set Screws

(In packages)	Pct Off List
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	46
¾ to 1 in. x 6 in., SAE (1035), heat treated	35
Milled studs	19
Flat head cap screws, listed sizes	5
Fillister head cap, listed sizes	28

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill.

Effective CaF, Content:	Base price per net ton
70% or more	$37.00
60% or less	34.00

LAKE SUPERIOR ORES

(51.50% *Fe, Natural Content, Delivered Lower Lake Ports*)

	Per gross ton
Old range, bessemer	$7.60
Old range, nonbessemer	7.45
Mesabi, bessemer	7.35
Mesabi, nonbessemer	7.20
High phosphorus	7.20

After Dec. 31, 1948, increases or decreases in Upper Lake freight, dock and handling charges and taxes thereon to be for the buyers' account.

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags	7.9¢ to 9.0¢
Domestic sponge iron, 98+% Fe, carload lots	9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+% Fe	31.5¢ to 39.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 microns, 98%, 99.8%+ Fe	90.0¢ to $1.75
Aluminum	27.00¢
Antimony	53.75¢
Brass, 10 ton lots	20.50 to 23.50¢
Copper, electrolytic	27.75¢
Copper, reduced	27.625¢
Cadmium	$2.40
Chromium, electrolytic, 99% min.	$3.50
Lead	13.50¢
Manganese	43.00¢
Molybdenum, 99%	$2.65
Nickel, unannealed	66.00¢
Nickel, spherical, minus 30 mesh, unannealed	68.00¢
Silicon	34.00¢
Solder powder	8.5¢ plus metal cost
Stainless steel, 302	75.00¢
Tin	$1.15 to $1.25
Tungsten, 99%	$2.90
Zinc, 10 ton lots	11.75 to 16.25¢

COKE

Furnace, beehive (f.o.b. oven)	Net Ton
Connellsville, Pa.	$14.00 to $14.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	$16.00 to $16.50
Foundry, oven coke	
Buffalo, del'd	$22.95
Chicago, f.o.b.	20.40
Detroit, f.o.b.	19.40
New England, del'd	22.70
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	20.45
Swedeland, Pa., f.o.b.	20.40
Plainesville, Ohio, f.o.b.	20.90
Erie, del'd	$21.50 to 23.50
Cleveland, del'd	22.45
Cincinnati, del'd	21.50
St. Paul, f.o.b.	23.50
St. Louis, del'd	20.98
Birmingham, del'd	18.66

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick

	Carloads, Per 1000
First quality, Pa., Ky., Mo., Ill. (except Salina, Pa., add $5)	$80.00
No. 1 Ohio	74.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	74.00
No. 2 Ohio	66.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	11.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$80.00
Childs, Pa.	84.00
Hays, Pa.	85.00
Chicago District	89.00
Western, Utah and Calif.	95.00
Super Duty, Hays, Pa., Athens, Tex.	$85.00 to 95.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	$13.75 to 14.00
Silica cement, net ton, bulk, Hays, Pa.	16.00
Silica cement, net ton, bulk, Ensley, Ala.	15.00
Silica cement, net ton, bulk, Chicago District	$14.75 to 15.00
Silica cement, net ton, bulk, Utah and Calif.	21.00

Chrome Brick

	Per Net Ton
Standard chemically bonded, Balt., Chester	$69.00

Magnesite Brick

Standard, Balt. and Chester	$91.00
Chemically bonded, Balt. and Chester	80.00

Grain Magnesite

Std. ⅜-in. grains

Domestic, f.o.b. Balt. and Chester, in bulk, fines removed	$56.00 to 56.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines	$30.50 to 31.00
in sacks with fines	35.00 to 35.50

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk, Midwest, add 10¢: Missouri Valley, add 20¢ | $12.25

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb.
(Metropolitan area delivery, add 15¢ to base price except Cincinnati and New Orleans (*), add 10¢; New York, add 20¢.)

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Baltimore	5.31	6.21-6.41	6.95-7.11	5.37	....	5.56	5.36	5.42	6.16	....	9.60-10.10	....	....
Birmingham	5.00	....	6.40	5.00		5.15	5.00	5.10	6.57	....	....	....	....
Boston	5.55	6.45-6.75	7.11-7.61	5.60-5.95	6.75	5.80	5.42	5.52	6.27	9.67-9.79	10.04-10.07	11.23	11.47
Buffalo	4.85	5.75	7.42-7.57	5.24	7.27	5.35	5.00	4.95-	5.40	9.30-	9.60	10.65	10.95
Chicago	4.85	5.75	6.95-7.10	4.85	5.55-6.66	5.10	4.90	4.90	5.40	8.90	9.26	10.25	10.55
Cincinnati*	5.16-5.51	5.84-6.28	6.58-6.93	5.28-5.43	....	5.53-5.85	5.33	5.33-5.48	6.08-6.20	9.74	9.99	11.19	11.44
Cleveland	4.85	5.75	6.70	5.03	....	5.21	5.01	5.01	5.45	9.05	9.35	10.40	10.70
Detroit	5.26-5.32	6.07-6.18	7.38-7.58	5.27-5.47	6.27-6.58	5.52-5.57	5.33-5.40	5.33-5.55	6.00-6.10	9.67	9.92	11.11	11.35
Houston	6.70-6.95	....	7.30	6.70	....	6.70	6.20-6.70	6.40-6.85	7.60	10.45	10.40	11.45	11.70
Indianapolis	5.29	6.13	7.44	5.29	7.36	5.54	5.34	5.34	6.14	11.25	11.39	....	....
Los Angeles	6.45	.... 7.90	8.05	6.65	8.35[5]	6.15	5.95	6.10	7.95[14]	10.95[15]	10.90[15]	12.45[15]	12.70[15]
Memphis	5.75-5.80	6.60	7.20	5.80-5.95	6.80	5.95-6.00	5.75	5.75	6.53	....	....	....	....
Milwaukee	5.03	5.93	7.13-7.18	5.03-5.38	6.86	5.28	5.08	5.08	5.63	9.53	9.78	10.98	11.23
New Orleans*	5.95	6.75	....	6.15	....	6.15	5.95	5.95	6.65[6]	....	....	....	....
New York	5.40	6.31	6.85-6.90	5.62	6.76	5.65	5.33	5.57	6.36	9.28	9.58	10.63	10.93
Norfolk	6.00	....	....	6.20	....	6.05	6.05	6.05	7.05	....	....	....	....
Omaha	6.13	....	8.33	6.13	....	6.38	6.18	6.18	6.98	....	....	....	....
Philadelphia	5.05	6.24[13]	6.58	5.40	6.29	5.35	5.10	5.40	5.94	9.05	9.35	10.62	10.87
Pittsburgh	.85	5.75	6.90	5.00	6.00	5.05	4.90	4.90	5.40	8.90	9.20	10.25	10.55
Portland	6.50[8]-6.90	8.00	8.80-9.10	6.85[8]	....	6.30[8]	6.35[8]	6.35[8]	8.25[14]	10.50[6]	10.10[6]	....	....
Salt Lake City	7.25[3]	8.20	8.80-9.30	7.65[3]	....	6.10[3]	5.70[3]	6.95[8]	8.30	....	....	....	....
San Francisco	6.15[8]-7.15	7.50[2]	7.90	6.75[8]	8.25[5]	6.30-6.35[8]	5.90[8]	5.90[8]	7.55	10.90[15]	10.85[15]	12.40[15]	12.65[15]
Seattle	6.70[4]-7.10	8.15[2]-8.65	8.80-9.30	6.70[4]	....	6.35[4]	6.30[4]	6.20[4]	8.15[14]	....	10.35[15]	.. ..	13.10[15]
St. Louis	5.22-5.37	6.12-6.27	7.32	5.22	6.68-7.54	5.47	5.27	5.27	5.82	9.27-9.72	9.57-9.97	10.62-11.17	10.92-11.42
St. Paul	5.44	6.19-6.34	7.54-7.64	5.44	6.82	5.64-6.69	5.49	5.49	6.04	9.49	9.79	10.84	11.14

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED:
Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED:
Sheets, 400 to 1499 lb strip, extras on all quantities. Bars 1000 lb and over.

ALLOY BARS:
1000 to 1999 lb.

GALVANIZED SHEETS:
450 to 1499 lb.

EXCEPTIONS:
(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 500 to 1999 lb; (10) 500 to 999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) up to 1999 lb; (18) 1000 to 1499 lb; (19) 1500 to 3499 lb.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight nor the 6 pct increase on total freight charges in the Eastern Zone (5 pct Southern Zone, 4 pct Western Zone), effective Jan. 11, 1949.

PRODUCING POINT PRICES

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	48.00	.....	.....	.....	.....
Birmingham	38.88	39.38	.....	.....	.....
Buffalo	46.00	46.50	47.00	.....	.....
Chicago	46.00	46.50	46.50	47.00	.....
Cleveland	46.00	46.50	46.50	47.00	51.00
Duluth	46.00	46.50	46.50	47.00	.....
Erie	46.00	46.50	46.50	47.00	.....
Everett	.....	50.00	50.50	.....	.....
Granite City	47.90	48.40	48.90	.....	.....
Ironton, Utah	46.00	46.50	.....	.....	.....
Lone Star, Texas	46.00	46.50†	.....	.....	.....
Neville Island	46.00	46.50	46.50	.....	.....
Geneva, Utah	46.00	46.50	.....	.....	.. ..
Sharpsville	46.00	46.50	46.50	47.00	.. ..
Steelton	48.00	48.50	49.00	49.50	54.00
Struthers, Ohio	46.00	.....	.....	.....	.....
Swedeland	48.00	48.50	49.00	49.50	.....
Toledo	46.00	46.50	46.50	47.00	.....
Troy, N. Y.	48.00	48.50	49.00	.....	54.00
Youngstown	46.00	46.50	46.50	.....	.....

DELIVERED PRICES (BASE GRADES)

Consuming Point	Producing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$0.50 Arb.	.....	50.00	50.50	.....	.....
Boston	Steelton	6.27	54.27	54.77	55.27	55.77	60.27
Brooklyn	Steelton	5.48	.....	53.98	54.48	54.98	59.48
Cincinnati	Birmingham	6.09	44.97	45.47	.....	.....	.....
Jersey City	Steelton	3.67	.....	52.17	52.67	53.17	57.67
Los Angeles	Geneva-Ironton	7.13	53.13	63.63	.....	.....	.....
Mansfield	Cleveland-Toledo	3.03	49.03	49.53	49.53	50.03	54.03
Philadelphia	Bethlehem	2.17	50.17	.....	.....	.....	.....
Philadelphia	Swedeland	1.31	49.31	49.81	50.31	50.81	.....
Philadelphia	Steelton	2.81	50.81	51.31	51.81	52.31	56.81
San Francisco	Geneva-Ironton	7.13	53.13-	53.63-	.....	.....	.....
Seattle	Geneva-Ironton	7.13	53.13-	53.63-	.....	.....	.....
St. Louis	Granite City	0.75 Arb.	48.65	49.15	49.65	.....	.....
Gulf Ports	Lone Star, Texas	.....	50.50	51.00†			

† Low Phos., Southern Grade.

Producing point prices are subject to switching charges; silicon differential (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.01 to 6.50 pct. C/L per g.t., f.o.b. Jackson, Ohio —$59.50; f.o.b. Buffalo, $60.75. Add $1.00 per ton for each additional 0.50 pct Si up to 17 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus $66.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, $73.78. High phosphorus charcoal pig iron is not being produced.

Ferromanganese

78-82% Mn, Maximum contract base price, gross ton, lump size.

F.o.b. Birmingham	$174
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	$172
F.o.b. Johnstown, Pa.	$174
F.o.b. Sheridan, Pa.	$172
F.o.b. Etna, Pa.	$175

$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	10.45
Ton lots	12.05
Less ton lots	12.95

Spiegeleisen

Contract prices gross ton, lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$64.00	$65.00
Pgh. or Chicago	65.00	66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, packed	35.5
Ton lots	37.0

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	28
Ton lots	30
Less ton lots	32

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, delivered.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	25.25	27.10	28.30
0.10% max. C,	24.75	26.60	27.80
0.15% max. C	24.25	26.10	27.30
0.30% max. C	23.75	25.60	26.80
0.50% max. C	23.25	25.10	26.30
0.75% max. C, 7.00% max. Si	20.25	22.10	23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.

Carload bulk	8.95
Ton lots	10.60
Briquet, contract basis carlots, bulk delivered, per lb of briquet	10.30
Ton lots	11.90
Less ton lots	12.80

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, $80.00; $78.50 f.o.b. Niagara Falls; Electric furnace silvery iron is not being produced at Jackson. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	20.70
97% Si, 1% Fe	21.10

Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 1 lb Si briquets.

Carload, bulk	6.30
Ton lots	7.90
Less ton lots	8.80

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size, bulk, in carloads, delivered.

25% Si	13.50
50% Si	11.30
75% Si	13.50
85% Si	14.65
90-95% Si	16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max. Si)

0.06% C	28.75
0.10% C	28.25
0.15% C	28.00
0.20% C	27.75
0.50% C	27.50
1.00% C	27.25
2.00% C	27.00
65-69% Cr, 4-9% C	20.50
62-66% Cr, 4-6% C, 6-9% Si	21.35

Briquets — Contract price, cents per pound of briquet, delivered, 60% chromium.

Carload bulk	13.75
Ton lots	15.25
Less ton lots	16.15

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, cents per lb chromium contained packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

0.20% max. C	1.09
0.50% max. C	1.05
9.00% min. C	1.04

Calcium—Silicon

Contract price per lb of alloy, lump, delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CMSZ

Contract price, cents per pound of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	15.75¢
Less ton lots	17.00¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11% Ca 5 to 7%.

Carload packed	17.00¢
Ton lots to carload packed	18.00¢
Less ton lots	19.50¢

SMZ

Contract price, cents per pound of alloy, delivered. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.25
Less ton lots	18.50

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered	$2.25
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained, V.	
Openhearth	$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound contained V_2O_5	$1.20
Ferrocolumbium, 50-60% contract basis, delivered, per pound contained Cb.	
Ton lots	$2.90
Less ton lots	2.95
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo.	$1.10
Calcium molybdate, 45-50%, f.o.b. Langeloth, Pa., per pound contained Mo.	96¢
Molybdenum oxide briquets, f.o.b. Langeloth, Pa.; bags, f.o.b. Wash., Pa., per pound contained Mo.	95¢
Ferrotitanium, 40%, regular grade, 10% C max., f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti	$1.28
Ferrotitanium, 25%, low carbon, f.o.b. Niagara Falls, N.Y., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti	$1.40
Less ton lots	1.45
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, carloads per net ton	$160.00
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton	$65.00
10 tons to less carload	75.00
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per pound of alloy.	
Carload, bulk	6.60¢
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	7.40¢
Ton lots	8.80¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk	11.00¢
Ton lots, packed	11.25¢
Less ton lots	11.75¢

Boron Agents

Contract prices per lb. of alloy, del.

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lot	$1.20
F.o.b. Wash., Pa.; 100 lb and over	
10 to 14% B.	.75
14 to 19% B.	1.20
19% min. B.	1.50
Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.	
Ton lots	$1.67
Less ton lots	1.79
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	$1.80
Silcaz, contract basis, delivered	
Ton lots	45.00¢
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, f.o.b. Suspension Bridge, N. Y.; freight allowed, Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.	
Ton lots, per pound	8.625¢
Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	$6.25

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Michigan Employment Trend Continues Down

Lansing, Mich.

• • • **The downward** employment trend which started in Michigan last November has continued during May, according to a recent announcement by the Michigan Labor & Industry Dept.

Employment by the automobile industry dropped 11.1 pct during May, the agency said, largely because of the Ford strike.

Based on reports from 158 plants, Michigan payrolls for May were down 15.6 pct compared with the previous month. Manhours were off 16.2 pct.

The Michigan iron and steel industry was off 8.5 pct compared with the previous month. Blast furnaces showed a decline of 12.9 pct; tools were off 8.7 pct; screw machine products declined 1.9 pct. Iron, pipe and plumber's supplies dropped 9 pct and wire work was off 3.7 pct.

In addition, a sharp decline of 16 pct was reported by 40 hardware and stamped-ware shops. Stoves and heating apparatus fell 3.7 pct.

Durable goods as a whole were off 8.6 pct compared with the previous month, while nondurable goods showed an increase of 2 pct, according to the report.

Reversing the trend of the first quarter of this year, food prices in average Michigan industrial cities rose 2.9 pct from Mar. 15 to June 15, according to the Michigan Dept. of Labor's quarterly food cost survey.

New Electronics Supervisor

Chicago

• • • **Virgil H. Disney** has been appointed a supervisor of electronics at Armour Research Foundation of Illinois Institute of Technology. Dr. E. H. Schulz, chairman of the electrical engineering department, stated that the recent growth of electronics activities at the foundation has necessitated a second electronics section. James L. Murphy, will continue as supervisor of one of the groups. Mr. Disney was formerly an assistant section head in research at the airplane division of the Curtiss-Wright Corp., Dayton.

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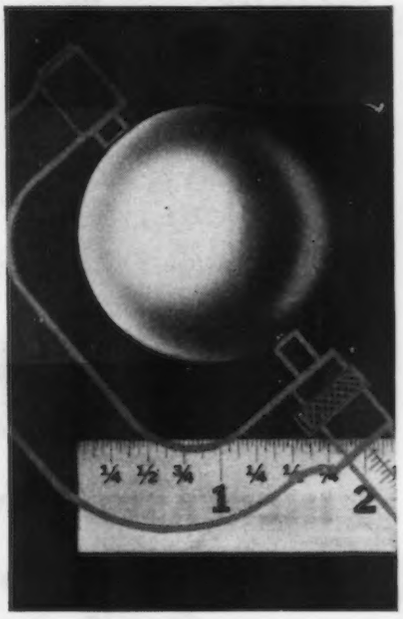

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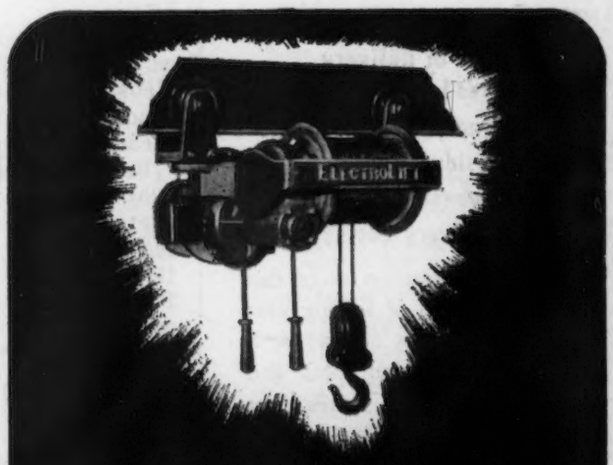

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